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TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1880.

PART I.

BOSTON:
PRINTED FOR THE SOCIETY.
1881.

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The Committee on Publication and Discussion take this opportunity to repeat what they have heretofore stated, that the Society is not to be held responsible for the certainty of the statements, the correctness of the opinions, or the accuracy of the nomenclature in the papers and discussions now or before published, all of which must rest on the credit or judgment of the respective writers or speakers, the Society undertaking only to present these papers and discussions, or the substance of them, correctly. The award of a prize or gratuity for an Essay is not to be understood as implying that the Committee approve it in every particular, but only that they believe it calculated, *on the whole*, to promote the science or art of Horticulture.

WILLIAM C. STRONG, *Chairman.*

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, January 3, 1880.

A duly notified stated meeting of the Society was holden at 11 o'clock, and was called to order by William Gray, Jr., the retiring President, who delivered the following address:

ADDRESS OF PRESIDENT WILLIAM GRAY, JR.

Ladies and Gentlemen,—The past two years have been uneventful ones in the history of the Society; with the exception of the celebration of its Semi-Centennial Anniversary by appropriate exercises here on the twelfth of September last, I recall nothing of marked importance that has happened.

Among the deaths have been those of Dr. Jacob Bigelow, the oldest member of the Society, its first Corresponding Secretary, and the projector of Mount Auburn Cemetery; of James Cruickshanks, whom most of us here to-day must remember with such kindly feelings; of John M. Merrick; of Cheever Newhall, one of the founders of the Society, and its first Treasurer; of his kinsman Josiah Newhall, one of the original members of the Society, and active and interested in all its affairs until a short time before his death, and of William R. Austin, for many years Treasurer.

The discussions have taken a wide range, and have been interesting and instructive as usual.

The exhibitions, although the amounts offered for prizes have necessarily been much reduced, have more than sustained the reputation of the Society. In some of them, notably the Rose

Exhibitions, there has been a marked advance over previous years in the number of exhibitors, and the interest shown by our members and the public generally. Five of the meetings for discussion in the last two years have been devoted to this subject. The silver cups offered for prizes at the Rose Show (the cost being met by private subscription) heightened the interest and excited a spirit of emulation among the growers, which will undoubtedly show its results in the coming years. Six of the cups were awarded outright; the seventh, the Challenge Cup, so called, must be won for three consecutive years before becoming the property of any one person, and I venture to predict that many years will elapse before it finds its final resting place. It is hoped and expected that these prizes will be continued annually hereafter.

I would call attention to the report of the Library Committee in regard "to the uses for which the Library Rooms are employed." They say, "While the propriety of leasing the Society's halls is not disputed, it is submitted that the rooms containing one of the most valuable horticultural and botanical libraries in the world should not be turned into a general headquarters for the managers of the miscellaneous exhibitions which visit Boston; who, by their loud conversation and passing to and fro, cause a confusion which is not in harmony with the objects of the Society, and which especially interferes with the legitimate uses of the library."

While agreeing with every word of the above it must be remembered that we have been passing through a season of great business depression, that we have been forced to reduce our expenditures to the lowest possible point, and to increase our income by every means that offered, and that, as much as some of the uses to which our building has been put, may be deprecated, there was no alternative.

Times are now changing, and real estate, always the last to recover, must soon feel the effect of the quickened activity in all other interests. I hope we shall presently be able to make such additions to our building as are needed to accommodate the library, and to give proper rooms for our Secretary, our committees, and for the use of those who engage our halls. This is for future consideration; but I think it would be true economy, and a good investment for the Society, to put its building in thorough repair at once.

In relinquishing the office held for the last two years I wish to

express my regret that business duties have so often prevented my being present at the meetings here, and to assure you that my absence has been from no want of interest in the Society.

And now I take pleasure in welcoming to his new office a gentleman of whom it has been well said that he is "unsurpassed by any member of our Society in his enthusiasm for horticulture."

The President elect, Hon. Francis B. Hayes, then delivered his inaugural address as follows:

Address of President Francis B. Hayes.

Ladies and Gentlemen of the Massachusetts Horticultural Society:

We have entered this year upon the second half-century of the Society's existence, the close of the first half having been appropriately commemorated by an interesting address delivered before you by a venerable ex-president, who was associated with the founders of the institution.

We have seen the young plant springing from seed sown by the lovers of the beautiful in nature, and nurtured by their fostering care, developing into a stately tree, which, under the same tender and watchful attention has towered into gigantic proportions, and from it offshoots have sprung which have beautified and benefited the entire country. The organization which originated with Lowell, Dearborn, Cook, Russell, and a few others, has grown in fifty years to a society of a thousand members, having financial resources in invested property larger in amount than any other horticultural society in the world. It was the first to establish in this country a "Garden of the Dead," and the example of Mount Auburn has created numerous rural cemeteries throughout our country. The National Pomological Society is also the offspring of this Society. The excellent flower, fruit, and vegetable markets of Boston, in many respects preëminent over all others in the country, owe much of their distinction to this Society. It has largely promoted the ornamentation of the many beautiful rural residences about us. It has stimulated the study of plants throughout the country, and the eminence of our University at Cambridge, with its valuable gardens and arboretum, as a place of botanical study, under the guidance of the distinguished botanists, Gray, Goodale, and Sargent, is not a little owing to the influence of this Society.

The past work and influence of our Society are referred to with

justifiable pride, and with sentiments of profound gratitude, as the results of the labors and contributions of its members, many of whom have gone to their reward, though there are some who are still spared to us, and who are active in sustaining, promoting, and extending the usefulness of our institution.

In recalling what has been accomplished by our predecessors, we are forcibly reminded of what our duty is if we would faithfully discharge the trusts imposed upon us as their successors. We must not be satisfied with what has been thus far accomplished, but we must be incited by their example to emulate our fathers in good works. We must not do our work as routine labor, following in the track which our predecessors made ; for if we do, we shall keep in the ruts, and accomplish nothing, or but little. But we must constantly endeavor to improve and enlarge the sphere of our labor, and strive to do our work better than it has been done heretofore. As our predecessors by their original ideas and personal efforts improved upon the past, so we must step forward boldly, and, by our studious investigations and scientific and practical industry, work out something new and useful in our several specialties. We have much yet to do to place ourselves in the first rank, in all respects, with other horticultural societies of the world. Though we have considerable investments in property, yet other societies realize by assessments, contributions, and other methods, larger sums of money to expend annually for horticultural objects than we do. The duty, therefore, is imposed upon us to watch carefully our financial concerns. We have still a considerable debt to be paid before we can hold our real estate unencumbered. It is not a heavy encumbrance, considering the value of the property, yet it is a debt to be provided for before the Society can enjoy all the income of its estate. We must continue vigilantly to see that we derive all the income we can fairly from our property, and we must scrutinize all expenditures. We must cultivate a wise economy, avoiding always that excessive frugality which would be highly injurious to our interests. We must employ the best men we can obtain for the administration of our affairs, and compensate them fairly ; and they must be held to strict accountability. We must remember that our Society was formed " for the purpose of encouraging and improving the science and practice of horticulture," and we must use the means to accomplish the object, and, therefore, we should not apply too much of our income to the good object

even of discharging our debts before their maturity, if we are thereby deprived of proper means to forward the interests of our Society by stimulating the culture of plants; but we must watchfully guard against increasing our present debts. We should see that prizes, as large in amount as we can afford, are offered to induce the highest art in the cultivation and public exhibition of flowers, fruits, and vegetables. The reports of your committees show that the Society during the past year has recognized, by their awards of prizes and gratuities, exhibitions of the products of the soil to a considerable extent; yet it has been a matter of surprise to many, that with so little stimulus of pecuniary advantage to exhibitors during the past year, the exhibitions have been so satisfactory as they have been. It shows that the pure love of horticultural pursuits has governed those who have made these exhibitions so beautiful.

It is a matter of doubt whether, however limited the resources of the Society may be, the money which is appropriated for exhibitions should not be more largely bestowed in prizes rather than so much in gratuities, as has been lately done. It is well for the committees to have some money for gratuities, to meet special cases, yet the offering of prizes tends to induce larger and better exhibitions of productions, as many would exhibit in the laudable hope of obtaining a prize which recognizes superiority, and be indifferent to a gratuity, which might be awarded to mediocrity.

Valuable contributions to horticultural science have been made through the discussions and essays which have been promoted by the Society's meetings during the past few years. It is to be hoped that a larger number of our members will be interested to attend these meetings than heretofore, and contribute the results of their experience and studies for the general good.

Our Library is a very important source of information upon horticultural subjects. It is rich in valuable books, carefully selected, which few horticultural students could otherwise obtain. We should continue to use the means within our control to enlarge its usefulness, and supply it with works of real scientific and lasting value, rather than ephemeral and cheap horticultural literature.

Our Library Room is somewhat contracted for the various uses to which it is appropriated. We have scarcely room in our elegant building, outside of our halls, for our largely increasing library, and for the necessary accommodation of the officers of the Society,

and of the members generally. It is, therefore, necessary that until additional rooms are provided, the Society should enforce regulations as to the use of the library room, so as to give our members a quiet and pleasant resort for pursuing their investigations, with as little interruption as possible. Though our building is large, yet the wants of our Society are increasing with its growth, and additional room is required for our purposes, or an increase of our funds to allow us to dispense with the necessity of letting our halls to obtain the requisite means for defraying the annual expenses of the Society. May we not hope that some liberal benefactor, recognizing the great good which the Society renders the public, will supply the want which now hampers our means of usefulness?

There is a vast deal for the Society to do to place it on the elevated plane it should occupy. We must not be satisfied with what has been attained; if we do, we shall decline and decay, while sister societies will outstrip us in the course. We should observe how vigorously horticultural investigations are carried on and promoted by many societies and individuals in Europe, and we can gain much by imitating them in looking to new and extended fields of usefulness which we have not yet entered. The weakness of senility, and of satisfaction in our present attainments and acquisitions, must not enfeeble our Society. We must preserve in it perpetual youth and energy that we may advance all the time to new achievements. Spasmodic exertion will be of no permanent advantage, but earnest, steady, constant, and quiet effort on the part of all for improvement in our loved science and art will accomplish the desired object. Each of us should try to do one thing in the best manner possible, and not, by attempting too much, fail in all. It is of great importance to be able to produce the best flower, fruit, or vegetable of a kind. It would be exceedingly valuable to the world to learn how that best specimen is grown. But little knowledge is requisite to grow many sorts and kinds in an ordinary manner, and such knowledge is of small value to any one.

Let, then, each one try to do at least one thing well, and by so doing he will best forward the interests of our association and the welfare of the community. And I would desire the same principle and rule of action to govern in all matters affecting our relations with the Society. If one be a cultivator, let him produce something superior to all others of the kind. If he be fond of studious investigation, let him turn his attention to scientific researches into the

operations of nature. Should his specialty be a love of books, let him do what he can to improve our library, and make it a great storehouse of information for horticultural students. If his skill be in finance, let him do all that is possible to preserve and augment the financial resources of our Society, that it may have the larger means of usefulness.

While we gratefully recognize what those with generous hearts and competent means have done for the Society by their large benevolence; and also what the past officers and prominent managers of the financial and business affairs of the Society have accomplished by their constant and gratuitous labor, we must not forget that the success of the Society mainly depends upon those who are the practical workers, and who contribute the results of their labor to the beautiful exhibitions which the Society is constantly making for the delight and profit of the community. Let me again express my appreciation of the work of those who have made our exhibitions so attractive as they have been; and let us trust that by the united exertions of all its members the Society will continue to be respected and honored for what it does to beautify and adorn our homes, and enrich and improve the community.

Ladies and Gentlemen,—When I remember the able and eminent men who have been my predecessors in the high office to which you have elected me, all of whom have been distinguished horticulturists, it seems almost presumptuous in me to enter upon the responsible duties of presiding officer of this institution; yet as you have unanimously called me to the position, I will enter upon its duties cheered by the hope that, with your assistance, I may, perhaps, be able to be of some advantage to the Society to which I dedicate my best services.

President Hayes's address was received with much interest and satisfaction, which was expressed by applause at the close.

On motion of Charles M. Hovey, seconded by M. H. Merriam, it was *Voted*, That the thanks of the Society be presented to Presidents Gray and Hayes for their interesting addresses, and that they be referred to the Committee on Publication.

The following appropriations, recommended by the Executive Committee, on the 1st of November, 1879, and laid over until this meeting, were unanimously voted,—

For Prizes, ...	$3,050 00
For the Library Committee, for the purchase of magazines and newspapers, binding of books and incidental expenses of the Committtee, ...	200 00
For the Committee on Publication and Discussion,	150 00

Ex-President Gray reported from the Executive Committee the following votes, which were passed:

Voted, To recommend to the Society that, until the finances of the Society will warrant it, no plate or other testimonials be presented to outgoing officials.

Voted, To recommend to the Society that the income of the Whitcomb fund of $500, to the amount of $30, be appropriated for prizes for vegetables in addition to the amount already appropriated for the year 1880, and that the number of prizes, time of award, and other details be at the discretion of the Committee on Vegetables; the prizes to be known as the Whitcomb Prizes.

Ex-President Gray also reported from the Executive Committee the appointment of E. W. Buswell as Treasurer of the Society for the year 1880, and Robert Manning as Secretary.

The Secretary read a letter from Francis H. Appleton, announcing the decease of Josiah Newhall, one of the original members of the Society.

On motion of C. M. Hovey, Mr. Hovey, Mr. Appleton and John B. Moore were appointed a Committee to prepare resolutions in memory of Gen. Newhall.

William C. Strong, Chairman of the Committee on Discussion, announced that the series of meetings for discussion the present season would be commenced on Saturday next, after the adjournment of the business meeting, when Joseph Tailby would speak on the cultivation of the *Cypripedium* and *Eucharis*, and a discussion would follow; and that on Saturday, the 17th, a Prize Essay, by Samuel Parsons, Jr., of Flushing, N. Y., on the Most Promising New Hardy Ornamental Trees and Shrubs, and their Tasteful and Effective Arrangement, would be read and followed by a discussion.

Further time was granted to the Treasurer to prepare his Annual Report.

Adjourned to Saturday, January 10.

BUSINESS MEETING.

SATURDAY, January 10, 1880.

An adjourned meeting of the Society was holden at 11 o'clock, President HAYES in the Chair.

E. W. Buswell, Treasurer, read his Annual Report, including the Report of the Finance Committee, which was accepted and referred to the Committee on Publication.

Charles M. Hovey, Chairman of the Committee appointed at the last meeting to report resolutions in memory of Gen. Josiah Newhall, presented the following:

Resolved, That in preparing a last tribute of respect to Gen. Josiah Newhall, who died at Lynnfield on the 26th of December, 1879, at the advanced age of nearly eighty-six years, and offering expressions of the loss the Society sustains in being deprived of his usefulness, his example, and his genial company, we must also recall his earlier days and hearty efforts, when a firm foundation was being laid for this now prosperous Society. Gen. Newhall was from its first enthusiatically and actively interested in all that pertained to its foundation, prosperity, and exhibitions. In horticulture and agriculture he was ambitious to originate and improve various kinds of fruits, and was always an earnest worker in everything relating to the culture of the soil.

He was Chairman of the School Committee of Lynnfield for twenty-two years, and was the first Representative from the town; he served in the war of 1812, and subsequently in the State militia; under President Jackson he held an office in the Boston Custom House; he was much interested in astronomy, and kept a very accurate record of the weather and rainfall.

He was most highly esteemed and respected by all who knew him, and in his death we lose a member whose heart was deeply in the work for which this Society was formed, and one whose actions were always directed to its welfare.

We shall remember him for his love of honor and integrity, and his interest in all that was for the good of the community, and this Society in particular.

Resolved, That these resolutions be entered on our records, and that a copy be sent to the children of the deceased, with the assur-

rance of our warmest sympathy with them in their sad bereavement.

Mr. Hovey in presenting the resolutions, spoke of Gen. Newhall as an old friend of his own and one whom he had known for many years. He was always, when possible, constant at the meetings of the Society, and had attended them until very lately. He was a man of strict integrity, and a representative of a generation now past, who gave their aid to the Society at a time when it was very much needed. Mr. Hovey concluded with the hope that the younger members of the Society would emulate the example of our departed friend.

John G. Barker spoke of Gen. Newhall as a near neighbor, and referred particularly to an address delivered by him at the last fair of the Essex Agricultural Society, of which he was one of the oldest members,—an address so filled with the fruit of ripe years and rich experience that listening to it was a pleasure to be long remembered. Mr. Barker commended the example of Gen. Newhall to the younger members of the Society as worthy of their imitation.

The resolutions were unanimously adopted, and the Society adjourned to Saturday, February 7.

MEETING FOR DISCUSSION.

Immediately after the adjournment of the business meeting, a meeting for discussion was held. The subject was

The Cultivation of the Cypripedium and Eucharis.

This was introduced by Joseph Tailby, who said, that in the last edition of Williams's "Orchid Growers' Manual," the *Cypripedium insigne* is described as having a solitary flower. A gentleman in England had a large plant in a pan which bore one spike with two flowers, and this was thought by the "Gardener's Chronicle," a very extraordinary instance. Mr. Tailby said that he noticed under each flower a little pouch, containing what he supposed to be a rudimentary flower, to be developed by cultivation, and he succeeded in the attempt to develop it. Some thought the production of two flowers on a spike was owing to the plant being of a different variety, but he was satisfied that it was due entirely to

cultivation. A small plant which Mr. Tailby had owned for thirteen months, was exhibited, showing the secondary pouches; and a small plant from M. H. Merriam, also showing the secondary pouches; but these small plants had not strength to develop the second flowers. Some have supposed the speaker had some secret method of developing the second flower, but he said that he was willing to tell all he knew. People buy plants of nurserymen who give to all the same directions for cultivation, and some succeed and others do not. The small plant exhibited was dwarfer from growing nearer the light. He had tried loam and fibry peat to grow them in, but thought the best method was to fill the pots one-third full of crocks, and the remainder with crocks, sphagnum, and coarse sand. Some in peat are not satisfactory. The pot must be well drained. They want a great deal of water, which should be given regularly. He used weak liquid manure, but it should not be made with ammonia or guano, and should be as clear as wine, or else it would clog the soil. The plants should be kept near the glass, but as cool as possible. The one shown was subjected to five degrees of frost in November. It might be well to put the plants out-doors in summer if there is plenty of shade and help. Of one hundred and eighty spikes, every one showed a second (rudimentary) flower. When a plant is once brought up to the point of producing two flowers on a spike, it should be kept up. This species is so easily cultivated that no attention has been given to it; indeed, it will bear any amount of ill treatment, but it is worth growing well. The flowers bring twenty-five dollars per hundred; a spike with two flowers on it is worth fifty cents. He had had nineteen spikes with two flowers each, and a hundred and eighty-two with one flower each. The plant shown by Mr. Merriam was probably grown in a dark place.

Mr. Merriam said that Mr. Tailby was right in supposing that his plant had not had sufficient light.

Charles M. Hovey asked what was the advantage of having two flowers on one stalk.

Mr. Tailby replied that the commercial value was quite important. It might be only a matter of taste, but the ladies and florists preferred two. Besides this, however, he liked to make progress in cultivation.

William C. Strong thought it an interesting fact in vegetable physiology that a plant could be brought by high feeding to develop

flowers from dormant buds, as had been done by Mr. Tailby with the *Cypripedium*.

Leander Wetherell asked whether all plants could not be developed by high feeding.

Mr. Strong replied that high feeding was apt to produce luxuriant growth, and did not always, as in this case, cause abundant flowering.

Mr. Tailby said that the condition of his plant was not wholly due to high feeding, — it must have good ventilation.

John G. Barker asked whether a plant could not be made to produce a still greater number of flowers, say four or five, on one stem.

Mr. Tailby said that two years ago he had a plant which showed a tendency to bear two flowers on a stem. It produced nine spikes, all having two flowers each, and he was satisfied that all could be made to, for all have the rudimentary flower. He could not say whether they could be made to produce four or five flowers on a stem, but thought they might.

Mr. Hovey said that Mr. Tailby's remarks were very interesting, and that if the plant in question continued to produce two flowers on a stem it would be of greater interest than at present, as showing that the habit had become fixed. Other plants sometimes produce an unusual number of flowers on a stem; in 1878 we had a spike of *Lilium auratum* shown with one hundred and forty flowers; in 1879 the plant produced four stems, with twenty-five flowers on each. If it had gone on to produce a spike of two hundred flowers, it would have shown that the habit was becoming fixed. We want to know whether this habit in Mr. Tailby's *Cypripedium* is fixed. We must consider it abnormal, until we have evidence that it is permanent. The speaker, however, liked a single flower on a stem best. Roses sometimes produce one flower above another, but when they do so it is only an interesting curiosity. Mr. Tailby's remarks showed that he had studied the nature of the plant carefully. The roots of the *Cypripedium* are large and fleshy, and want an open soil.

Mr. Tailby said that the lily referred to by Mr. Hovey was a monstrosity, while the two flowered spikes of *Cypripedium* were produced by cultivation. Cranston says that the superimposed roses are caused by gross feeding. Boule de Neige, especially, is apt to be affected in this way. All *Cypripediums* have the rudimentary

bud, and only need cultivation to cause it to flower. The English cultivators have never noticed this fact. The plant which now bears two flowers on a spike will go back if not properly cared for.

Mr. Barker said that the *Cypripedium insigne* is valuable for window or conservatory culture. He had had a plant flowering in a window since the 15th of December.

Mr. Tailby agreed with Mr. Barker as to the value of the *Cypripedium* for window culture. *C. insigne* is the best for this purpose. It will keep in flower two months.

Mr. Strong thought the case of the *Cypripedium* was not at all like that of the *Lilium auratum*. The former was a development of a dormant bud, while the latter was a monstrosity. It should be understood that the *Cypripedium* is capable of such development.

Mr. Hovey thought the cases of the *Cypripedium* and the lily were somewhat analogous, but if the plant exhibited produces two flowers on a stem next year we may conclude that it is due to high cultivation.

Mr. Merriam expressed his admiration of Mr. Tailby's plain, straightforward remarks, and his confidence that his statement and theory were correct. He thought the case of the *Cypripedium* differed entirely from that of the *Lilium auratum*. The undeveloped bud of the *Cypripedium* contains the promise and the prophecy of flowers.

James Comley said that the plant shown by Mr. Merriam had three or four times produced stems with two flowers on each, but it had since been neglected and had partly died. The part now dead produced a stalk with two flowers. He had seen *Cypripediums* produce two flowers on a stalk for twenty years; they have done so in England. Mr. Harris, Mr. Hunnewell's gardener, has a plant with two flowers on a stem. The question is whether this effect is caused by cultivation. He thought it could be produced by taking off the suckers from the plant, but he would rather have twenty stems with a single flower on each than two stems with two flowers each, and would rather have a greater number of spikes than have triplets. It is not the nature of the *Cypripedium* to grow in sphagnum; he would give them loam and brick rubbish. They are generally kept too dry. All orchids will take a portion of liquid manure.

Mr. Tailby said that if he had but one spike with two flowers

he could get two dollars for it. He could get a dollar for a Dog rose or a Sweet Brier when he could get but five cents for a Bon Silene. He objected to Mr. Comley's plan of removing the suckers from the *Cypripedium*. He would not say that two flowers on a stalk are handsomer than one, but they will bring more money.

Mr. Hovey said that *Cypripedium Sedeni* has produced seven flowers on a spike. Other species have two or three flowers. *C. insigne* is considered hardy in England. The speaker had plants in a house where the thermometer fell to 26°; one which stood in a current of air was blackened; the others were not injured. He thought it could be kept over winter in a frame. Many of the new and high-priced species are not as beautiful as this. He still thought that there was very great analogy between the monstrous inflorescence of *Lilium auratum* and the production of two flowers on a stock by the *Cypripedium insigne*.

James O'Brien said that Mr. Tailby's skill in cultivation was conceded, and that he himself had fifty plants and every year had some spikes with two flowers. He had one very fine one at this time. He would be very glad to have the point of permanence settled.

Mr. Tailby said that in ten pans he had nineteen stalks with two perfect flowers on each, and one with a third rudimentary flower.

Mr. O'Brien said that the production of two flowers on a stem in his plants was not owing to high cultivation; the roots were growing over the sides of the pot.

Mr. Tailby said that this indicated a plant in good condition.

Mr. O'Brien added that the flowers were in demand before Christmas, and all were cut except the stem now having two flowers, which might for this reason have received extra nutriment.

The discussion of the *Cypripedium* ceased here, and the *Eucharis Amazonica* was taken up. Mr. Tailby, who had been very successful in cultivating it, said that in England three crops of flowers are raised in a year; but he believed that when this is done the second crop comes from bulbs which are maturing while the first are flowering. He did not think the same bulbs had strength to flower again in three months or even twice a year. In a pan with eighteen bulbs he got eighty-seven flowers, and he had exhibited one spike of ten flowers. The bulbs must be ripened; they require to be matured as much as a hyacinth or any other bulb. They

must have time to ripen the foliage, and must be dried off for this purpose, but the bulbs must not be allowed to shrivel. After the flower buds have once started they must be encouraged and not be allowed to receive any check. He has them in three inches depth of soil; they want coarse stuff as *Cypripediums* do, and much water. Bottom heat is not essential, but it is an advantage. They can be grown in a greenhouse where the temperature runs down to 38°.

Mr. Strong said that he saw the *Eucharis* growing over hot-water pipes in Mr. Tailby's house, and thought it benefited by bottom heat, but now he was inclined to doubt whether it was.

William H. Spooner, Chairman of the Flower Committee, called attention to a cyclamen shown by James O'Brien.

Mr. O'Brien said that it had a double flower. He often got plants which produced double flowers, but they seldom maintain that character; this one, however, has done so for four or five years.

Mr. Tailby said the only way to perpetuate it would be to fertilize the flowers and save seed from them.

Mr. O'Brien said that it made seed very sparingly; he did not think the double character any additional beauty.

Mr. Hovey agreed with Mr. O'Brien that the doubling was no improvement. With all the advance that we have made in the cultivation of the cyclamen we still fall far behind European cultivators. He visited an exhibition in England where one grower had a hundred and ninety pots, including the *C. giganteum*, a very large flowered variety. The plants are neglected here; they should be made a special object of culture, as is done by three or four men in England, who have several thousand plants each.

Mr. Tailby thought this double cyclamen had a commercial value; an English seedsman would pay a high price for the seed of it.

The Chairman of the Committee on Discussion announced for the next Saturday a Prize Essay, by Samuel Parsons, Jr., of Flushing, N. Y., on the Most Promising New Hardy Ornamental Trees and Shrubs, and their Tasteful and Effective Arrangement, to be followed by a discussion.

MEETING FOR DISCUSSION.

Saturday, January 17, 1880.

A meeting for discussion was holden at 11 o'clock, William C. Strong, Chairman of the Committee on Publication and Discussion, presiding. The following Prize Essay, by Samuel Parsons, Jr., of Flushing, N. Y., was read by the author.

The most Promising, New, Hardy, Ornamental Trees and Shrubs, and their Tasteful and Effective Arrangement.

To explain the meaning and fair application of such words as promising, new, and hardy, and to suggest a tasteful and effective arrangement of a series of ornamental plants that may properly be included in such a definition, I cannot perhaps do better than to describe to you a choice and well planted lawn. The picture, as a whole, will then explain itself as well as the manifold relations of various parts. I desire, indeed, to make evident the unity and just proportion of the scene, and, at the same time, to dwell duly on the individual traits of each plant. These plants cannot fail to gain peculiar interest, when you come, as it were, to associate with them and study sympathetically their wants, caprices, and many lovely qualities.

Here is the picture:—A simple cottage, low, rambling, and picturesque, enclosed by boundaries of shrubbery on every side. Fifty feet east and west extend the side lawns, and down to the north slopes gradually the main stretch of turf, till it ends in the winding banks of a clear and rapid stream. A part of the bank is somewhat marshy, and here the opportunity has been taken to plant sundry interesting herbaceous plants or wild flowers that affect such spots. Willows of various kinds droop over the water, and birches strike vigorous roots into moist and congenial soil. Alders wave and cypresses stand elegant and tall in similar spots, until we come to solid dry land in the north-west corner. Here are masses of Norway spruces, alternated with white pines, and here and there an Austrian pine. This evergreen grouping extends nearly up to the house. The shelter thus afforded is therefore most complete, forming protection and back-ground alike. This portion of the framework of the picture also serves to bring out harmoniously and effectively, sundry beautiful groups and single

specimens of the finer evergreens. As we approach the house, these evergreens become smaller and more dwarf, until, immediately about the building, we find plants that grow only two feet, perhaps, in ten or fifteen years. Back of the house and at the sides, grow deciduous shrubs, large and effective, bordering the entire remaining portion of the domain. These are varied at intervals, by the loftier heads of deciduous trees,—maples, elms, and the like, the trunks of which are entirely hidden by the thickly and naturally disposed shrubbery. On the corners, especially, are planted large elms, intended to mark and define more completely the boundaries of the lawn. Just within the enclosure grow a few choice, medium sized trees, standing isolated, as it were, but everywhere else we meet mere shrubs or dwarf trees. As a rule, moreover, we find evergreens and deciduous plants each grouped by themselves.

Yet with all this variety of trees, the lawn proper, or greensward, remains very prominent, its broad, well cultured stretches being on the whole the most noteworthy part of the design.

Wandering amid such scenes as I have just hastily sketched to you, let us take sundry notes, giving our attention chiefly to new, hardy, ornamental trees and shrubs, and their tasteful and effective arrangement. As we turn into the paths immediately about the house, the first objects that attract special attention, are various small shrubs, or rather miniature trees. We are struck by them, because, though they have evidently a family likeness, they are yet as diverse in appearance as it is possible for plants to be. They stand either singly in some prominent position, or in clusters of three or five on curves or intersections of paths. There must be at least twenty of them and scarcely two of them are alike. Inspection of their labels tells us they are Japanese maples, chiefly but not entirely of the *polymorphum* species. Rare curiosities indeed! We doubt if you have often seen their like before. Yet they have been known to explorers and plant collectors fifteen, twenty, and even, in some cases, fifty years. Experts have long recognized how remarkably their shapes vary, from the more common type of maple foliage to the extreme of cut-leaved forms, and how their lace-like tissues are dyed with purple and gold in June. They have been exhibited and sold in Europe, in a limited way, for at least fifteen years, but, strange to say, in face of the simple facts, there has existed a wide-spread conviction that their

hardiness is defective. Hence we read of them as pot-grown, a condition that must always prevent the full, free development of their beauty. Some one must have finally, and perhaps accidentally, left them unprotected in the open ground during winter, for we may now find them growing in the most exposed positions, apparently as hardy as any maple. The only weakness of which they now continue to be accused, is a tendency to burn and fade under the stress of exceptionally hot summer days. But as there are very few established plants in this country, perhaps we may find that as they become more permanently settled in the soil, even this weakness will disappear. I know such to have been the case in Thomas Hogg's collection, which includes the specimens which have been longest planted in this country. They were imported somewhere about 1862 and 1864. Any summer day one may see in this collection, all kinds of Japanese maples standing entirely uninjured by sun or cold. The fact is, that most, if not all, Japanese maples, set out up to this date, have been imported from Japan and were accustomed to very different conditions in their own country. They have also, in all probability, been hurt to the core by the voyage, and, in addition to this, have been weakened for our purposes by the Japanese system of ultra dwarfing, so that it is not strange if they seem to have a poor chance in America. I feel confident that American born plants, when we have them well established on our lawns, will do better; but, even as it is, scarcely one summer in five will specially burn their leaves, and as they grow older the danger decreases. It must be remembered, moreover, that no variegated-leaved plants stand the heat of July and August without injury. They may not, in many instances, burn, but they will fade. A natural query also arises, as to why Japanese maples are so rare. They have been long recognized as gems among hard-wooded plants, and, for house interior decoration only, would have been well worth extended propagation. This question may be fairly asked, but the answer thereto is not easy to find. A practical system of propagation has, for some reason, remained until recently undiscovered. Layering was found to be a slow and unsatisfactory process, and seed would not, of course, reproduce with any certainty the different varieties. American and European maples were employed in vain, as stocks to receive Japanese scions, because the junction made by grafting, though apparently successful for a time, invariably failed within a year. Finally, after the

manner in which such discoveries usually happen, several propagators in both Europe and America, about the same time, came to the conclusion that they must use the parent stock, *Acer polymorphum*, for all varieties of its own offspring. It was all very simple, but why did no one think of it sooner? Thanks to this discovery we may now hope in a few years to see Japanese maples more plentiful throughout the country. Nevertheless, we need not hope that their propagation will ever be easy. It would be contrary to the nature of the plant.

Let us look at a few of the varieties that may strike us as specially noteworthy. First, and perhaps the most popular, comes *Acer polymorphum sanguineum*. Its main attraction is the full rich red or purple that dyes the leaf; otherwise it is simply solid and vigorous for an extremely dwarf tree. The *sanguineum* variety performs very much the same ornamental part among shrubs as the purple beech does among trees, with less shining lustre and more richness of hue. Surely I could not give it higher praise. Nearly related in appearance, and yet very distinct from *sanguineum*, is *Acer polymorphum atropurpureum*. The tints of its leaves are darker, and perhaps duller than those of *sanguineum*, but it has a taller, more picturesque habit, and is better and more artistically suited for growing in pots or tall vases for interior decoration. We have yet to avail ourselves of the extreme aptitude these Japanese maples have for room and window decoration during February, March, and April. They burst into leaf, as it were, in a moment, and exhibit a refined and exquisite effect in keeping with the decorations of the most dainty boudoir. In mentioning these varieties of Japanese maples, I must not forget the original species, *polymorphum*, which grows better than many of its varieties, and is only less exquisite than the best of its offspring. Indeed, though the prevailing color of its leaves is green, it often throws out sports of pink, yellow, and white, thus illustrating afresh its erratic tendency,—that tendency which has enabled Japanese cultivators to display their horticultural ingenuity in perpetuating so many attractive varieties by skilful grafting. There are white variegated forms of *polymorphum*, like *albo-variegatum*, and a beautiful crimped-leaved kind, delicately shaded and tipped with rose. It has more or less of the white and yellow color of the last. Then there is *versicolor*, of larger habit, and sharper, longer leaves, white and rose tipped. *Reticulatum* has light green, trans-

lucent leaves, crossed with light colored lines, which give it a distinctly veined appearance. *Polymorphum* offers us weeping forms as well as dwarf forms, but most curious of all, are two or three cut-leaved kinds. The green *palmatifidum* is the simplest variety of the cut-leaved type. Not remarkable for peculiar color, the leaves are cut into a semblance of coarse lace; curious, weeping, and graceful. No more delicate weeping tree exists than these *palmatifidum* and kindred forms. After a slow growth, for a dozen years, perhaps, these miniature trees begin to droop in long, sweeping folds. When the green becomes purple, as it does in *palmatifidum atropurpureum*, *dissectum atropurpureum*, or *ornatum*, which are one and the same varieties (for dire confusion in catalogue names exists here), the effect is still more charming. In *pinnatifidum* and *pinnatifidum atropurpureum*, the effect is even more unique, because, though quite as cut-leaved, its divisions are yet simpler and more elegant. *Dissectum foliis roseo-pictis* is fairly shred-like in its fine divisions, and in addition has a variegation consisting of pink, yellow, white, and green. Strange to say, the apparently delicate, narrow-leaved forms like *roseo-pictis*, endure burning suns better than the broad-leaved kinds.

All Japanese maples heretofore mentioned, have been of the *polymorphum* species, and, indeed, *polymorphum* maples, with two or three exceptions, are practically the only Japanese maples we are able to obtain for the lawn. One of these I shall note now, and another when I consider new and rare deciduous trees. The maple I now propose to examine is *Acer Japonicum* — medium sized, with vigorous, splendid leaves. To me these leaves seem only surpassed among Japanese maples by those of its golden variety. *Japonicum* has bright green leaves, ridged and crinkled, and of solid texture. A special beauty of this variety lies in its flowers. They are long, pendent, and pink; more striking in every way than those of the scarlet maple. Still, perhaps the most charming of all Japanese maples is *Acer Japonicum aureum*. Although a variety of *Acer Japonicum*, it is very different. The leaves are rounder, and the lobes of the leaves smaller and less deeply cut. Nevertheless they are almost large for a medium sized tree, and in color most delightful. Rich, pure gold mingles here with faint suffusions of green, thus producing the most subtile and delicate variations of color on the same leaf. I should like to speak still farther of Japanese maples, but other new ornamental plants

must have their turn now. Let us give our attention, therefore, to a brilliant cluster of flowers growing on a curve of one of the paths near the house; a path that winds down gently towards the gate. It looks, indeed, charming, thus situated on a slope of green, for it is a group of *Azalea mollis*. You may reasonably ask why we speak of azaleas, even hardy azaleas, for, as a class, they are by no means new or rare, although, perhaps, excelled by no hardy shrub for exquisite color and other goodly qualities. *Azalea mollis*, however, is hardly an azalea in the ordinary sense of the term. It is, moreover, Japanese, and of recent introduction, as introductions go, for a new plant really ought to have ten or fifteen years to obtain a positive foothold on American lawns. The flowers are the chief attraction of *Azalea mollis*, as, indeed, they are of all azaleas. At first glance they seem much like those of the hardy or Ghent azalea, only very much larger and more showy. On closer inspection, however, we recognize also a considerable resemblance to the rhododendron. The clusters are nearly as large as those of that plant, and the corollas are not unlike it in shape. But the color and texture of the flower mark it an azalea in the fullest sense. The color, indeed, is much deeper and richer, but it shows the same shades — salmon, pink, orange, and scarlet. The question, of course, presents itself, Why do not these azaleas take the place of all other hardy azaleas? Simply, because nothing choice in nature can have its place exactly filled by any thing else. These *Azalea mollis*, you will notice, are arranged in a group by themselves, and in a somewhat sheltered, well-drained spot. They are liable, because they bloom very early, to have their blossoms destroyed by late frosts. While young, too, the wood is sometimes winter-killed. The ordinary hardy azalea, on the other hand, is surpassed by few shrubs in capacity to endure various exposures. Specimens of *Azalea mollis* are planted together *en masse*, because of their showy appearance. It would be hardly fair to group them around the outskirts of rhododendron beds in the manner so effectively employed with hardy or Ghent azaleas.

Seeking out more especially Japanese deciduous shrubs for the moment, we note, clustered in a retired corner, a little group of *Daphne Genkwa*. Although by no means striking plants, they have a refined, quiet beauty that grows on one. They are slender and upright growing, with numerous long, downy twigs which, in early spring before the leaves appear, are garnished with violet-colored, tubular, dainty-

looking flowers rather less than an inch long. This plant seldom attains a height of more than three feet. *Eleagnus longipes*, the Japan oleaster, growing near, is another striking and curious plant. It is of small size, with spreading, somewhat irregular branches, and leaves bright green above and silvery-white beneath, studded with brown scales. The small, yellowish flowers are produced in great profusion on long stalks, and are succeeded by berries of an oblong shape and deep, transparent, orange-brown color. These berries are likewise speckled with brownish scales. I cannot help remarking on another *Eleagnus* on this lawn, *E. argentea*. It is not only comparatively new, but very choice and rare. Silvery-leaved plants are always interesting, and this is perhaps the most silvery-leaved plant known to our lawns. The leaves are of good size and rather long, and the plant has generally a somewhat straggling habit, but the sheen of its silver is always unsurpassed. It seems to be very hardy, too, which gives an additional reason for noticing it here.

But what is this creamy-white cluster of flowers growing like those of a deutzia? The odor is delicate and delightful. Large, roundish leaves, however, distinctly mark its difference from the deutzia. Altogether it is a very decided acquisition, bearing the rather difficult name, *Pterostyrax hispidum*. *Styrax Japonica* has deutzia-like leaves, but very different flowers. It is less striking in appearance than *Pterostyrax hispidum*. Here, also, is an actual *Deutzia*, with leaves marbled with silver, and a new Japan quince, remarkable for unusually large, rosy-pink flowers, double the size of the familiar form of *Pirus Japonica*. Another of these Japan quinces also attracts us with its tri-colored pink, white, and green foliage.

Little globes of curled and crisp dark green leaves, minute and very compact, may be seen here and there about the house, covered with small red flowers, that bloom off and on all summer. It is *Spiræa crispifolia*, doubtless a variety of *S. callosa*. Very dwarf and free flowering, it is one of the most useful shrubs of this character. We note also *Rhodotypos kerrioides*, a very pretty shrub, something like a small blackberry bush in general appearance, but more delicate, and covered with numerous small white flowers, shaped not unlike those of an althea. Somewhat prominent, also, is *Diervilla* (*Weigela ?*) *Lavallee*, with chocolate-colored flowers, blooming freely a second time during the latter part of the summer.

I must not forget to call your attention to a larger shrub on this part of the lawn, which you will doubtless recognize as a sumach. It is much larger and more tree-like than our common form, and quite spreading. It is *Rhus Osbecki*, a Japanese sumach of much rarity. The leaves of this sumach have the wing peculiar in a greater or less degree to the midrib of that plant, so enlarged as to be very striking, especially during the intensely scarlet glow this plant takes on in fall. No color can be finer than the autumn tints of *Rhus Osbecki*. The flower in June is, moreover, very effective.

Among the Asiatic shrubs, I may very properly here call attention to certain new magnolias. They occupy, in two cases at least, the transition point between trees and shrubs, but they are more properly shrubs, since their peculiar beauty demands that their branches be preserved close to the ground, which gives them, in everything but size, the effect of a true shrub. The really shrub-like magnolia is *Magnolia Halleana* or *stellata*, the most compact and slow-growing of its race. It has been introduced from Japan for many years, but has not, until recently, been received with anything like the attention it deserves. The leaves are dark green, somewhat small for a magnolia, and given to disposing themselves in very picturesque masses. If it is the most dwarf of Asiatic magnolias, it is also the hardiest and most readily transplanted. Its prime charm consists in its flowers. They are more than creamy white, they are snow-white, with a peculiar brilliance of texture; but, more than all, they are delicately fragrant, — more fragrant than any other hardy magnolia, except the one I am about to point out to you. When open, these flowers, which come earlier than the bloom of any other magnolia, and before the leaves, remind one of the star-shaped clematis, but in their loveliest form, half opened, their graceful curves are like those of white water-lilies. The earliness and beauty of this flower, and the sudden manner in which it bursts into bloom, indicate a capacity for producing early forced flowers of the finest quality. I only wonder florists have not recognized its value in this respect. *Magnolia Halleana* occupies the outskirts of an irregular group of different magnolias, situated near the boundaries, and not far from the house. Back of it, and very conspicuously placed, is the latest attraction from Japan, *Magnolia parviflora*. It reminds one of a large-growing *Magnolia glauca*, our common sweet-scented swamp species. The leaves are rich and massive, and the general habit

as vigorous as any of the Asiatic magnolias, but the flowers, which bloom in June, are simply charming. Beautiful also, exceedingly, in a curving cream-colored cup of petals, the stamens and pistils unite into a crimson elongated mass that contrasts most effectively with the surrounding white. Yet, attractive as all these qualities are, the odor surpasses them altogether. Doubtless, you know the half-hardy southern *Magnolia fuscata*. If you do, you may conceive something of the degree of sweetness of *Magnolia parviflora*. From a plant standing near the far end of a greenhouse one hundred feet long, the spicy odor impresses you immediately on opening the door. A large *Magnolia parviflora* has proved perfectly hardy for several years, and good judges declare it a great acquisition.

On the other hand, if it were not for *Magnolia parviflora*, we should consider the somewhat longer known *M. hypoleuca*, unrivalled in its way. This magnolia, of which there is a fine specimen on our lawn, is as hardy and vigorous as *M. parviflora*. The leaves are much finer and longer, being over a foot in length, silvery underneath, with a bright red midrib and leaf stem. Creamy white and delightfully sweet-scented, *M. hypoleuca* blooms as late as *M. parviflora*, and apparently as sparsely. But, sparsely or not, it is very pleasant to see such attractive flowers in June, having parted regretfully from our beautiful Chinese magnolia blossoms more than a month before. The silvery green and red of the leaves of *M. hypoleuca* vary somewhat in beauty, but are always rich and effective. One specially noteworthy point about many of the plants we have been considering, is their peculiar adaptation to places of the restricted dimensions of, say half an acre, or even less, a consideration which, I contend, is destined to carry more and more weight as the capacity for ornamentation possessed by these small places becomes better understood.

I should have called your attention to a beautiful single white althea, the form of its flower is so simple and elegant; but we must pass on to larger trees. Among valuable hardy plants are the members of the entire genus of maples. Here, amid fringing shrubs, or standing singly on their outskirts, we find still other interesting kinds. *Acer colchicum rubrum* recalls the Japanese maples, for it, too, is a Japanese maple, and a very peculiar one. It grows and looks somewhat like *Acer Pennsylvanicum*, a species that seems almost identical, at least in appearance, with more than

one species in Asia and Japan. *Acer colchicum rubrum* is properly *Acer Mono*, or *lætum*, and grafts only fairly on the Norway maple, the stock generally used. It is, indeed, difficult to propagate at best, and, therefore, rare. The charm of the tree lies in its red twigs and rich red foliage, in June, and also in its red second growth in late summer and early fall. Much of the tree, even in early summer, remains green, so that the numerous brilliant red leaves create a beautiful variegated effect. The green leaves have angular lobes and a neat, elegant appearance that would alone render the tree very attractive. The position this tree occupies on our lawn is somewhat sheltered, for it is not always and everywhere entirely hardy. Several curious varieties, or closely allied forms of this maple come to us also from Japan. Some of them are mottled with white in odd fashion, while others bear pure snow-white leaves, which, unlike the white-leaved *Acer Negundo*, endure summer heat and sun perfectly well. Unfortunately, these forms are still more difficult than *Acer colchicum rubrum* to propagate, and less hardy.

I should notice, also here, one or two new and rare Norway maples, that are very charming on the lawn, and perfectly hardy, after the manner of all Norway maples. *Acer platanoides Lorbergii*, is deeply cut as to its leaves, with the young growth of a more or less reddish color. *Acer platanoides Schweidleri* is the finest of these Norway maples, which are well represented on this lawn. The large, striking leaves take on the most brilliant red in June, and in August and September the second growth glows richly amid the general green of the foliage. These trees are specially valuable, because they belong to the Norway maple species, in most senses our best hardy shade tree. Passing out on the main lawn, we note a single tree of very distinguished appearance, quite distinct from anything we have observed before. It is the golden catalpa. One of our most effective lawn trees is the catalpa. Broad, massive foliage, shadowy and most grand, characterizes the effect of this tree. It retains its foliage, moreover, late in fall, grows rapidly, and, by its large, prominent appearance, impresses the eye from the most distant part of the lawn. Conceive all this effective foliage then painted with solid golden tints, and you have the golden catalpa (*Catalpa syringæfolia aurea*), which we note here on the lawn in question. The young growth is, of course, most prominent, and in fall the richness of coloring is often very striking amid the wide-spread dulness of incipient leaf decay. Long clus-

ters of white, fragrant flowers are also fine in August, which is very late for sweet-scented flowers.

Aralia Japonica, of which there is a fine specimen, is comparatively new, and very interesting. It is a low tree, with a spreading, umbrella-like head. The leaves are very large, curiously or deeply divided, and surmount branches and trunk of thorny or prickly habit. Altogether, it is a strange-looking tree, and very hardy. It bears in autumn long, waving clusters of brownish purple fruit, or seed-vessels, which characterize the tree. The flower is quite as effective as that of the common *Aralia spinosa*, or devil's walking-stick. It also affects soil of moderate fertility, having, doubtless, the failing of the family, viz.: throwing up shoots or suckers from the roots. Deep, rich soil would, in all probability, aggravate this failing.

On a gentle slope near one side of the lawn, where the effect of a weeping tree may be most happily presented, is a new pendulous Japan cherry. We have long had small weeping cherries, round-headed, neat, and very symmetrical; well fitted to perform an ornamental part on the lawn similar to that accomplished by the Portugal laurel, which is not hardy in our portion of the United States. The weeping cherry on this lawn is a different affair. It is tall, vigorous, and in every way like a common fruit-bearing cherry, except that it weeps. And it literally does weep. No deciduous tree, if we except the beech, does its weeping in more persistent, charming, and original fashion than this cherry. The flowers, moreover, in early spring are very attractive, fairly covering the tree with small pink blossoms. Combining, as it does, so many ornamental qualities with a hardy and easily propagated nature, it forms, unquestionably, a lawn plant of much value. But come with me down by the stream; there are some interesting plants in that region. First, let me call your attention to a weeping deciduous cypress (*Taxodium distichum pendulum*). It is quite new, although in most ways a simple southern cypress, with all that cypress's soft, feathery grace and elegant outline. The brownish red bark and erect stem of the southern cypress are also there, but added to these qualities is the great charm of weeping curves, persistent and distinctly drooping. This cypress may be now and then a little eccentric in habit, but usually curves soberly downward. Like its parent type, it enjoys moist soil—indeed detests dry sandy quarters. In this section of the lawn there are several interesting

alders, the natural haunts of which are moist places. *Alnus firma*, and one or two other Japanese alders are specially interesting, with their green, ball-like seed-vessels and shining, elegant foliage at seasons. I like to note these alders, for their presence here shows regard for a genus of plants too much neglected. Here, also, grow several interesting Japanese willows, *Salix Sieboldii*, and a curious dwarf, *Salix sericea pendula*.

The ashes are seemingly out of favor with some lawn planters, yet we ought to see them more freely used; for prejudice in this case is entirely unfounded. They are hardy and not more prone to disease than other ornamental species, and they are all possessed of beauty as varied even as maples or elms. Many will recall the round, rich, symmetrical elegance of the walnut-leaved ash (*Fraxinus juglandifolia*), as well as the beauty of the more common American and European ashes (*F. Americana* and *F. excelsior*). Come with me, however, and look at this aucuba-leaved ash (*F. excelsior aucubæfolia*). What a rich mottled gold dyes the leaf, and how attractive the roundish outline of its shining foliage. Near by is *Fraxinus punctata*, still more beautifully shaded with gold. But these comparatively old variegated ashes are almost thrown into the shade by the curious tints and forms of two or three new varieties. Note this *Fraxinus excelsior concavæfolia*, with its white and rosy tints, marking strongly the young growth alike in summer and in fall, until, at a distance, one readily fancies the tree crowned with rich hued flowers. The entire young leaf, in this case, is more or less mottled with white and rose. Another ash, to which I want to draw attention, has light green, attractive foliage, but it is specially noteworthy for the curiously perfect curves of its downward drooping branches and leaves. This is *Fraxinus scolopendrifolia*. Then there is the Japan ash (*F. elonza Japonica*), distinguishable by its small leaves and drooping, graceful form. The Japan silver-leaved ash (*F. Japonica argentea*), is likewise represented by a good specimen. It is one of the best and most constant of variegated-leaved trees. The leaves are broadly edged with silvery white, which sometimes suffuses the entire leaf. There is also a golden and equally attractive variety of this Japan ash. The cut-leaved form of the ash is found in *Fraxinus Japonica serratifolia*, and we have the dwarf form of ashes illustrated by *F. excelsior atrovirens*, a curious tree of almost diminutive habit, with dark-green curled leaves fairly hugging the stem. I like to

dwell on the ashes, for they are neglected unjustly. My notes are very brief, and do but scant justice to the many fine ashes on this lawn.

Notwithstanding the beauty of the ashes, however, we turn with pleasant anticipations to look more closely at the oaks. Most original, perhaps, in form, of all species of hardy or ornamental trees, as well as enduring and grand, we are all familiar with many effective kinds. Here we find, however, certain strange new forms. The planter seems to have appreciated the magnificent qualities of the oaks as lawn trees, and gathered together a notable collection of them. I will note briefly some of the most interesting.

Quercus Pannonica, the Hungarian oak, one of the finest of its species, is a grand tree that is not exactly new, but is certainly very rare. It has great, shining, deep-lobed leaves, and grows vigorously; a quality not always specially peculiar to the oak. This reminds me of a form of the pyramidal oak, a member of this group, *Quercus pyramidalis cucullata*. The pyramidal oak is, perhaps, the most rapid growing of oaks, and as it also has curious leaves, curled down at the edges, you will readily perceive that in this variety we have found an interesting tree. Cut-leaved forms attain their extreme development among oaks in *Quercus heterophylla dissecta*. The leaves are literally cut into mere shreds. There are several variegated-leaved varieties of oaks. The most familiar we notice on this lawn is *Quercus pedunculata argentea*, a beautiful and striking variety, with its dark-green leaves variegated along the edges with silver. Passing from this simpler type, we notice about us various more complex developments of a similar coloring, which, indeed, needs only a little warming in tint to turn it into gold. *Quercus tricolor variegata* is more broadly and curiously streaked and spotted with red and white, becoming in fall tri-colored in appearance. Among the more warmly tinted leaves we have *Quercus aureo-viridis*, with leaves broadly striped with yellow between the ribs. This variety, though fine, only leads us suitably to a specimen of the true golden oak, *Quercus concordia*, in some senses the noblest deciduous tree of our lawn. The peculiarity of this oak is, that it lacks the deep golden tint in June,—in fact it is distinctly greenish-gold, but in August a full, broad, rich gold suffuses the entire leaf, and, as the tree grows well for an oak, it is easy to conceive, even without seeing a specimen, what a grand effect it must make. This color seems to grow richer and richer

as summer wanes and autumn appears. It does not, in fact, gain much richness after August, but by the increasing contrast between the surrounding fading tints and its fresh, healthy yellow, it becomes more and more prominent. The deepest color is shown by the purple oak, *Quercus nigricans*. This species is more permanently brownish-violet throughout the summer, but, unfortunately, it is not very hardy in the climate of New York and northward. The weeping oak is represented on this lawn by a grand specimen. Many have doubtless heard of the excellence of this variety. But it is hardly likely that many are conversant with its peculiarly rapid growth for an oak. I have seen a young weeping oak grow five feet and over in one season, and that in poor soil. One curious fact about these golden variegated and weeping oaks is, that they belong very generally to European species. Possibly the variations of American kinds have not been noted with the same care by propagators, for the simple reason that, until recently, far too little consideration has been accorded American lawn planting material.

Grand as the oaks are, we turn to the elms as capable of furnishing us lawn planting of equal, if different, importance. Here we have Roessel's golden elm, *Ulmus campestris aurea*, a small elm, as elms go, but bearing leaves solidly and beautifully suffused with yellow. It grows, of course, near the house, in accordance with its smaller habit. *Ulmus viminalis* is another slow growing elm. It is, however, distinct and elegant, with small rough leaves and numerous smooth, slender, twig-like branches, which are even somewhat pendulous, like those of the famous cut-leaved birch. *Ulmus campestris Berardi* is a beautiful miniature elm, of slender growth and pyramidal habit, with deeply and delicately cut foliage. There is also a weeping variety of much rarity, called *Ulmus rugosa pendula*, with large rough leaves. The Siberian elm, *Ulmus parviflora*, is an old elm, perhaps, but quite new on our lawns. On the lawn in question, there is a fine specimen, with upright habit and dark, slightly curled, small leaves, which remain green far into winter. I know, indeed, of hardly one true deciduous tree that stays green as late.

A great contrast with these smaller forms is afforded in the same genus by *Ulmus fulva pendula*. It stands in a prominent position, where it can be seen against a background of sky without injuring valuable views from the house. The position is selected, of course, opposite a slight break in the boundary of foliage. The leaves of

this slippery elm are not unlike those of the common American elm, except that they are far more remarkably weeping and persistent in hanging on the branches late in fall. American elms, we know, are somewhat remarkable for their dull fading tints, which appear, during some seasons, as early as mid-August. The special characteristic after all, of this weeping elm, is the way it throws about great, far-reaching branches, which curve out and downward in a very grand fashion. Such a vigorous, erratic growth, however, needs curbing, and the pruning knife must be used at times remorselessly. I have to designate just what weeping elm I mean, for there is another well-known and choice variety, of European origin, and equally pendulous habit, called the Camperdown weeping elm, which is by no means rapid growing.

Among the lindens, our attention is attracted by a curious variegated kind, which shows leaves spotted and streaked with yellowish-white, often to the total exclusion of green. And we must not forget to notice, down near the stream, a fine specimen of the purple-leaved birch. It is one of the best among new acquisitions of lawn planting material. The general habit is that of a somewhat dwarf-growing birch, but the color is brownish red, copper color, or more truly a deep rich purple. Good purple-leaved varieties of any tree are not common. Indeed, we may not hope soon to gain anything of equal value with the purple beech, but the birch is in itself so fine that it is a great thing to discover a purple-leaved variety of that tree.

I feel that I have only touched on the many new and valuable deciduous trees on the lawn, but I have accorded them more space than the evergreens, because I believe deciduous trees are, in the main, best suited to our lawns in America. Intense, though short-lived, heat and sudden changes do not favor the growth of evergreens in the same degree as the more equable climate of Europe. We find, however, on this lawn, a very choice collection of new evergreens. Among the spruces we note several, and chief among those the large-leaved hemlock (*Abies Canadensis macrophylla*), the weeping hemlock (*Abies Canadensis pendula Sargentii*), and the blue spruce of the Rocky Mountains (*Picea pungens*). The hemlocks of this trio are peculiarly suited to small places, but the last named spruce is of larger size. Breadth and depth of masses and color, statuesque form, and curious yew-like habit, characterize the broad-leaved hemlock. It has little of the ordinary appearance of the hemlock about it, and is more hardy

under the peculiar conditions that sometimes affect the common hemlock. It was a seedling discovered in Flushing a few years since, yet it has already achieved favorable recognition from the best judges of lawn planting material. If the broad-leaved hemlock is somewhat stern and masculine in its outline, the weeping hemlock is essentially feminine in its graceful curves and fountain-like sprays of green. Many ordinary hemlocks take on this weeping form in early youth, but it soon passes away with increasing years. With Sargent's weeping hemlock, however, this beautiful habit is absolutely permanent on all specimens grown from grafts of that tree. Henry Winthrop Sargent discovered this weeping hemlock about twenty years ago, near his place, at Fishkill on the Hudson, and moved by his enthusiasm and appreciation of choice ornamental trees, entrusted it for propagation to the distinguished expert, J. R. Trumpy. Turning from this queenly tree, we note the rich grandeur of the third member of our trio of distinguished evergreens. *Picea pungens* is said to be very grand in its natural home of the Rocky Mountains, but its young and more carefully cultured growth on the lawn is without question more beautiful and charming. It is, moreover, the bluest of evergreens, and extremely hardy and vigorous growing withal.

I should, perhaps, note in passing a fine large *Abies excelsa elata*, a very singular variety of Norway spruce, originating in Flushing. It grows strongly and throws out long branches of grotesque form. One might fancy it, by a little stretch of the imagination, a fit substitute for *Araucaria imbricata*, which many wish to grow on their lawns in America, but cannot.

The next group of evergreens we notice is Japanese, and clustered variously in the same section of the lawn. *Abies polita*, the tiger-tail spruce, is one of the finest and most valuable of the Japanese conifers. It is rich and very characteristic in its form. The yellow-barked branches extend out stiff and straight, and the glossy, bright green, stiff-pointed leaves are as sharp as, and not unlike, the spines of a hedgehog. The curious appearance of the ends of the young growth, or half-bursting leaf buds, doubtless suggested the name of tiger-tail spruce. *Abies polita* grows slowly, and, therefore, belongs to the class of evergreens specially fitted for small places. But this little cluster of evergreens close by is even better fitted for such work. They are Japanese junipers and very hardy. Their elegant forms and rich tints would, indeed, render them

distinguished any where. One is silvery, at least on a portion of its leaves; another is almost solid gold, and another, *Juniperus aurea variegata*, has its leaves simply tipped with gold in the daintiest fashion imaginable.

Let us look at these two Japanese pines that show so richly, even at a little distance. One is *Pinus densiflora*, with bright green leaves, long and very effective. This tree grows very rapidly, soon requiring the application of the pruning knife. In coloring and general habit, it is, perhaps, the best of Japanese pines, except *Pinus Massoniana*, which only surpasses it in a yellowish tint that generally pervades the leaves. But the *Pinus Massoniana*, par excellence, is the golden-leaved form of that species. It is bright gold, that seems to gain a touch of deeper gold as you pause to look at it. This peculiar effect is greatly enhanced by the fact that it has two leaves only in a sheath, and these leaves are so clustered on the end of the branches as to spread in every direction. It was this peculiarity that gave rise to the name sun-ray pine. But the noteworthy habit of this pine is its late variegation. In June, while in full growth, it is rather greenish golden than golden, but, all through the summer, its yellow grows brighter, until, in September, it makes a very striking object amid the fading leaves of fall. It makes, in fact, a worthy companion for the golden oak, *Quercus concordia*, which, you will remember, has the same peculiarity. It should be also noted, that the brightness of the sun-ray pine remains uninjured during winter, and it never burns in summer, a quality that other so-called golden pines have sadly needed. The bright yellow of the sun-ray pine is confined in a peculiar manner to about two-thirds of the leaf. Beginning at the base, first comes gold, then an equal amount of green, aud then again as much gold at the tip. The dividing lines between these colors are marked with singular distinctness, thus giving the utmost delicacy and finish to the variegation. *Pinus Massoniana variegata* is on the lawn in question, but it is, nevertheless, very rare and hardly to be obtained anywhere.

We come now to the *Retinosporas*, or Japan cypresses; the choicest, I was about to say, of all evergreens; certainly the choicest, as a class, of all recently introduced evergreens. To Robert Fortune, the great English collector of plants in Japan, we owe, probably, the real introduction of the leading species of *Retinosporas*, namely: *R. plumosa aurea*, *R. pisifera*, and *R. obtusa*,

and a greater benefit could hardly have been done the lawn planter than by the introduction of these evergreens. They are hardy, of slow growth, and of most varied beauty in individual specimens, the latter being a quality greatly wanting among some evergreens commonly used throughout the country, arbor vitæs, for instance. The *Retinosporas* graft readily on the *Thujas* or arbor-vitæs, and bear a certain resemblance to them, but the resemblance only that can exist between a beautiful plant and one much less attractive. Let us look at a group of the new and rare *Retinosporas*, although unfortunately all are comparatively rare on our lawns. In asking you to look first at *R. filicoides*, I am selecting one of the very choicest and most curious green species or varieties. If it were not for a peculiarly thick, curled border along the leaf of this variety, it might be readily taken while young for an evergreen fern. It is a spreading plant of slow growth and great hardiness. Indeed, I might say, once for all, that the *Retinosporas* are of unexcelled hardiness, both winter and summer, and that their variegations are all permanent. Can a higher character be given to any other evergreen?

There are two distinct kinds of weeping *Retinosporas*, namely, a beautiful, fern-like, pendulous form of *R. obtusa*, originating in Flushing, and an extravagantly attenuated form imported recently from Japan through Thomas Hogg. The long thread-like leaves of this variety fall directly down and curve about the stem in swaying, meagre masses, which suggest that in this plant the extreme of the weeping form among evergreens has been reached. Almost as curious as this is another introduction of Mr. Hogg, *R. filifera aurea*. We have known *R. filifera* for some time as a rare tree, with tesselated, shaggy masses of green thread-like foliage, but Mr. Hogg's new variety offers the same strange mass of foliage, only in this case it is turned into gold—broad, solid, permanent gold. While I am pointing out the golden *Retinosporas*, which are veritable sunbeams amid other evergreens, let me call your attention to *R. obtusa aurea*, one of the best and most distinct of all variegated forms. It is free-growing, with a beautiful combination of gold color intermixed with glossy, rich green all over the plant. Although not exactly a new plant, I am constrained to call your passing attention to *R. obtusa nana*, one of the very best of dwarf evergreens—a dense, flat tuft of glossy, deep green spray—a cushion or ball of evergreen foliage that will hardly

grow two feet in ten years. The golden form of *R. obtusa nana* is charming. Its yellow is a rich bronze, and I do not know anything of the kind more attractive. *R. pisifera nana variegata* is also very beautiful—a dense miniature bush of a general bluish-gray aspect, except a portion of the lesser branchlets and leaves, which are pale yellow. But do not think I have begun to exhaust the curious forms of these *Retinosporas*. I have only given the most noteworthy to be found on a superior lawn. Any large group of *R. obtusa* will give you a dozen beautiful, diverse forms of weeping, pyramidal, and dwarf or spreading evergreens. All, or practically all, kinds of *Retinosporas* now used, came from Japan, where they are common, but highly valued in the beautiful gardens of that country. Mr. Hogg has not only introduced several of these new *Retinosporas*, but has given us possibly more new Japanese plants than any collector since the time of Robert Fortune's famous horticultural explorations. I must not leave these *Retinosporas* without calling attention again to their excellent adaptation to small places. If we restrict the planting on a small lawn to Japanese maples, *Retinosporas*, and two or three shrubs like *Spiræa crispifolia*, we may, with a little skill, almost defy the power of time to compass, by means of trees, the destruction of our grass plots. I must add, however, one other conifer to this seemingly short but really varied list of new hardy plants suited to miniature lawn planting.

I refer to *Sciadopitys verticillata*, the parasol pine, one of the most extraordinary evergreens known. The plant we see on this lawn is scarcely two feet high, and yet it is more than ten years old. Travellers in Japan tell us of specimens in Japanese gardens fifty and one hundred feet high, but certainly in youth the plant is wonderfully dwarf. Its strange habit is produced by the curious long, broad, dark green needles, or narrow strap-shaped leaves that cluster in parasol-like tufts at the end of each succeeding year's growth. The color is as dark as that of the yew, and the growth as compact. It is moreover, very hardy, and thus presents a combination of choice qualities, of the most strange, attractive, and valuable character. The plant is so entirely original in its forms, that it seems some lone type, the correlations of which are lost or yet to be found. As we look upon it, we begin to realize how thoroughly most plants of the same genus, all over the globe, are related to each other, just because we can think of nothing else that resembles the parasol pine.

A Japanese yew, near by, of rich and spreading habit, exemplifies this resemblance between different members of a genus situated in various parts of the earth. This Japanese yew, *Taxus cuspidata*, is, however, very noteworthy for great hardiness, a character that can be scarcely accorded to any other yew in this climate. *Thujopsis Standishii* is another Japanese plant on this lawn, of comparatively recent introduction. I want to call your attention to it, situated near the *Retinosporas*, not only because it is a beautiful evergreen somewhat like the arbor-vitæ in general appearance, but because it does better here, apparently, than in England. This is a peculiarity remarkable in an evergreen, for the moist climate of England seems to make for them a very home.

I should like to speak of other plants on this lawn, but they are either too difficult of attainment, like the *Cercidiphyllum*, a promising tree, or, like the dwarf pines and spruces. hardly new enough to come within the scope of this essay.

Before leaving the spot entirely, however, let us stand a moment and take a last look at the unity of effect accomplished on this lawn. Streams, borders of foliage, statuesque small trees and larger specimens, all flow, as it were, together in natural lines. Indeed, harmony of color and lines, combined with contrasts distinct enough to give variety, characterize the entire scene. The position of each plant is so related to the others, for purposes of beauty and perfect development, that one delights in the fair proportion and entire unity of the design. It is a picture, and yet something more than a picture: a combination of foliage and grass, constructed not in servile imitation of nature, but on the principles employed by nature in her most pleasing work. The copse or glade is suggested, and yet the treatment of each plant of our lawn is very different from that of the wildwood, and indeed, more honorable to that plant's highly cultured nature. Perfect maintenance and exquisite keeping are evident everywhere, from the skilfully-pruned shrub to the velvet turf that catches athwart its beautiful surface the level rays of the setting sun. Unfortunately, such lawns are extremely rare in America. We are learning to appreciate them, and in time shall have them, though the progress in that direction is slow; and I feel certain that nothing is more likely to aid in the development of a true knowledge of the resources of lawn planting than the consideration of new hardy ornamental trees and shrubs, and their tasteful and effective arrangement.

Discussion.

The Chairman said that we were greatly indebted to Mr. Parsons for the experience as to the new trees and shrubs and their arrangement, which he had given us. He came from a more southern latitude than ours, and possibly all the plants which he has mentioned may not succeed here. On this point the Chairman said he would, next week, ask the criticism of Mr. Harris, Mr. Atkinson, and other skilful cultivators, but on this occasion we had with us a gentleman well known to be thoroughly versed in the subject before the meeting, and the editor of the new edition of Downing's "Landscape Gardening,"—Henry Winthrop Sargent, of Fishkill, N. Y., of whose presence he desired the Society to have the advantage.

Mr. Sargent spoke first of the weeping hemlock, which was introduced by him, and which he said was a very good "find" by an old farmer on the mountains back of his (Mr. Sargent's) house. He has the largest tree of it, which is eight feet high, and spreads from fifteen to twenty feet. He has assisted the leader by tying it up to a stake. It is difficult of propagation. Mr. Sargent thought that all the trees and shrubs mentioned by Mr. Parsons could be grown here, and recommended particularly the golden yew, though for small lawns the *Retinosporas* are preferable. The golden color of the yew lasts only during its growth. It is the hardiest thing he has, except the *Cryptomeria Japonica*. Four or five years ago, when Norway spruces and white pines were destroyed, his *Cryptomeria* was not injured. He is always sure to find it green. Last year, an epidemic injured arbor-vitæ hedges; his own hedge which was planted forty years ago, next after A. J. Downing's, was so much injured that it must be taken up. He felt satisfied that we clip our evergreen hedges too close; the English have found out that the constant cutting back of trained fruit trees lessens their vitality. The *Cryptomeria* referred to, is from twelve to fourteen feet high, and stands under a weeping birch, fifty feet high, where it gets no morning sun and no southern sun, and is protected from the northwest winds. He has others which grow nearly as well. The golden yew is hardier than any other yew. The English yew grows with him without any difficulty; his trees have shelter on the east and southwest. It is more hardy than *Taxus Japonica*, *T. baccata*, or *T. erecta*. The finest evergreen tree he has is *Pinus ponderosa pendula*, whose branches hang down perpendicularly. He was much impressed with the remark of R. S. Field, that all

evergreens are beautiful in their youth, say, when five or six feet high, but when twenty feet high they lose their individuality, so that a Scotch fir, forty or fifty years old, looks like an Italian pine. There are twenty or thirty species, which all look alike at the age mentioned. Sir Joseph Hooker thought *Pinus Lambertiana*, the finest tree he saw in the country. Mr. Sargent has a specimen fifteen feet high. He said that if he were restricted to one evergreen tree, it would be the golden yew.

Mr. Parsons mentioned the *Cercidiphyllum*, of which Mr. Hogg has a tree fourteen feet high. The leaf resembles that of the *Cercis*, or Judas tree.

Mr. Sargent spoke of Lawson's cypress; he had no trouble in growing either the type or the variety *erecta viridis*. The varieties *argentea* and *aurea* he had also found hardy. His largest tree of the type is twenty-two feet high, and frequently sends out a shoot of golden color, which is propagated.*

The foliage of the Japanese maples suffers in the sun, and the leaves dry up and crinkle in hot weather, but there is nothing hardier in winter. They might be grown in pots like azaleas, so as to be very effective. They should, when so grown, not have too much sunlight, but should present the entire leaf surface to the light. Japanese nurserymen send to purchasers, instead of an invoice, a series of leaves representing the different varieties.

Mr. Parsons said that while the foliage of the Japanese maples suffers in the sun when the trees are young, those of fourteen years growth, in Mr. Hogg's grounds, do not suffer. The speaker had found them more hardy as they got age.

Mr. Sargent said that he imported *Acer polymorphum atropurpureum*, eight or ten years ago, and it is now six or seven feet high. In July and August the leaves crinkled, and when twelve degrees of frost came last October, the leaves were still full of sap and suffered. Though there was no change in the color of the leaves, he feared for the result, for the wood had not hardened.† But, seven years out of ten, they will be successful. They would do better in a shady or humid situation, than in a hot, dry place, or, if planted in sunlight, with their feet in moist soil, that would

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* This tree, we are sorry to learn, has been destroyed this year by field mice.

† The same thing happened in August, 1880, from drought. H. W. S.

be best of all. There are no better evergreens than the *Retinosporas; R. filifera pendula* has truly thready branches, which hang down three feet not larger than knitting needles. All villa residences of two or three acres, should have *Retinosporas*, golden yews, and Japanese maples, instead of Norway spruces and trees of similar character. The speaker thought that in future we should have small places of four or five acres instead of those of five hundred acres, and these should be planted with magnolias, dwarf horse-chestnuts, and other trees of secondary growth. He has on his grounds a dwarf horse-chestnut forty years old, which is ten feet high and a hundred and twenty feet in circumference. This species is desirable as flowering after the others.

The chairman stated that the essayist was limited to new species, which would account for his omitting the golden yew, so highly recommended by Mr. Sargent. For the same reason, probably, the *Viburnum plicatum* was omitted. *Acer platanoides purpureum* is a distinct variety of the Norway maple—as striking and distinct as *A. platanoides Schweidleri.*

Mr. Sargent said that he had been much disappointed in *Acer platanoides purpureum*. *A. platanoides Schweidleri* loses its color. Dwarf evergreens should be planted in loose groups; you may have trees twenty-five years old not above a foot or two high. The *Chamæcyparis sphæroidea argentea* is of pyramidal form, with the tips of some of the branches silver and others golden. All silver tipped trees suffer more than golden. The *Chamæcyparis aurea* at Fishkill is quite hardy. Among deciduous trees the aucuba-leaved ash is desirable; the leaves are blotched with gold, and the tree resembles a gigantic *Aucuba Japonica*, but it is not constant. The golden oak (*Quercus concordia*) and the golden catalpa are very beautiful and desirable. The *Ulmus rugosa* is very curious; the tree is of pyramidal form, and the leaves are rough and rugged.

The Chairman said it was important to bring the trees and shrubs mentioned by the essayist before the public, but he thought we should have to cut down the list to adapt it to this latitude. The *Acer platanoides purpureum* mentioned by the speaker is new, and he had been pleased with it from one year's experience.

Mr. Parsons mentioned, as desirable small evergreens, the *Juniperus Japonica aurea* and *J. Sinensis aurea*, which have the foliage picked out with gold. They are very hardy—like red cedars for endurance.

Mr. Sargent said that Feast's and many other varieties of *Buxus* succeeded with him. *Euonymus radicans variegata* is recommended in English books as a substitute for the ivy. In England they train it against a wall like *Cotoneaster*, and he believed Walter Hunnewell has succeeded in this method of growing it. Charles S. Sargent thinks ours is not the same as the English. It is perfectly hardy, and valuable for edgings.

Mr. Parsons said he knew it would climb.

It was voted to continue the discussion of the subject the next Saturday.

MEETING FOR DISCUSSION.

SATURDAY, January 24, 1880.

A meeting for discussion was holden at 11 o'clock, William C. Strong, Chairman of the Committee on Publication and Discussion, presiding. The Chairman called on William Gray, Jr., for information concerning the *Abies Menziesii*, or, as it is termed by the latest authorities, *Picea pungens*.

Mr. Gray said that Prof. Asa Gray gave him three plants grown from seed collected on the eastern side of the Rocky Mountains, in Colorado, one of which was glaucous blue, one light sea-green, and the other intermediate. The greenest one made the most growth. They show some tendency towards spindling, but not to losing their lower branches. Mr. Gray added that the *Sciadopitys verticillata* or umbrella pine is one of the most promising new evergreens, and is perfectly hardy. He had two variegated ones, both of which were destroyed by the winter, though his experience with variegated trees had been that they are generally as hardy as the plain ones, and some of them more so. The golden yew is more hardy than the plain one; the green one grows stronger, and does not ripen its wood. All the Japanese evergreens that he had tried were hardy. *Cryptomerias* appeared to be hardy if they had shelter. The *Euonymus Japonicus* and the *Picea pungens* from Waterer were not hardy.

The Chairman said that Robert Douglas, of Waukegan, Ill., is

of the opinion that Waterer's trees are of the California type. He had imported trees from France which proved not to be hardy.

F. L. Harris, gardener to H. H. Hunnewell, said that the specimen of *Picea pungens* at Wellesley, came originally from Dr. Gray. It is more glaucous than that at the Botanic Garden or than William Gray, Jr.'s. The latter are glaucous but not so much so as Mr. Hunnewell's. The Douglas spruce never thrives when imported from Europe, but those raised here by the speaker had proved perfectly hardy. Some of them are twelve feet high and clothed with foliage. *Abies polita* and *A. Cephalonica* are among the best. The specimen of the latter at Wellesley is twenty feet high. *Abies Nordmanniana* will take the place of the European silver fir. Whenever a coniferous tree produces seed its growth is checked. *Abies Nordmanniana* produces large cones, which, though very striking in appearance, should be removed to promote the growth of the tree. *Retinospora squarrosa* should be more generally planted; it grows luxuriantly, is beautiful both in summer and winter, and is perfectly hardy. *R. plumosa* and *R. plumosa aurea* are the same; they require shelter when young. *R. filicoides* and *R. filifera* are very beautiful for small yards, and the speaker hoped to see them planted in the place of Norway spruces. He could not say that the Japanese maples are successful except *Acer polymorphum* and its variety *atropurpureum*. The foliage of the finely cut and delicately tinted varieties shrivels up. The species just named seeded well contiguous to an ash-leaved negundo, and he expected to get something remarkable from it, but the seed was stolen. He did not agree with Mr. Sargent in regard to pruning evergreen trees, as respects specimens, but hedges must be pruned severely while young. Isolated specimens only need to have the luxuriant shoots taken out so as to keep them within bounds. Mr. Harris suggested that when Norway spruces grew too large the limbs should be cut off within a foot or two of the trunk. Though this would disfigure them for a time, branches as large as a man's wrist would soon send out young shoots and form a beautiful column. The best time for such pruning is when the sap begins to flow, say from the 20th of April to the 10th of May. When rhododendrons get straggling they may be treated in the same way.

The Chairman said that while seedlings of the Douglas spruce from Europe are tender, those raised from Oregon seed are hardy. The experience of Robert Douglas, as well as of Mr. Gray and

Mr. Harris, is to the same effect. The Colorado type is hardy. If we encourage the seeding of specimen trees whose hardiness is doubtful, we may get a hardy type. He had raised seed of *Cupressus Lawsoniana*, but it did not vegetate.

Mr. Harris said that though *Cupressus Lawsoniana* is not generally hardy, there is a specimen at Wellesley eighteen feet high. It is protected by a belt of white pines. Such protection is necessary for many species.

Henry Winthrop Sargent said that his *Picea pungens* is the same as Mr. Gray's. His theory is that they should be cut back as soon as they begin to look spindling. He cuts back *Quercus concordia* nearly to the ground, and the golden catalpa quite to the ground. The finest *Retinospora* at Wellesley is getting to be what the English call "woody." He thought this was to be a trouble with the *Retinosporas*, and that they should be cut back. Mr. Harris is right, from his standpoint, about cutting back hedges, but twenty years hence he may think differently. The speaker treated his hedge as Mr. Harris advised, but soon began to have dead wood, and last year there was hardly any foliage. He cut back as suggested in "The Garden," but the trees had not vitality enough to recuperate, and now nine out of ten of them are dead. The hedge is forty years old. The same experience has been general on the Hudson river. A hedge which, though not vigorous, presents a general appearance of verdure, is better than a dead one. The arbor-vitæ hedge was invented by A. J. Downing fifty years ago, and there is one at his place fifteen or twenty feet high. The speaker would take off the tips of the shoots with shears and keep the top even, but would clip less and less every year, and when the hedge got sufficient height would give only a general trimming. All colored evergreens should be clipped, say once in two years. Except *Acer polymorphum sanguineum* and *A. polymorphum atropurpureum* all the Japanese maples will do best in pots.

The Chairman said that *Retinospora squarrosa* is one of the finest varieties; there is none more charming in Mr. Hunnewell's grounds. The specimens there are much superior to those at Mr. Parsons's. There is a sub-variety *Veitchii*. The difficulty in cutting back *Retinosporas* is that it makes them more dense, and favors the growth of fungi, as in *R. ericoides*. *Retinospora squarrosa* generally requires thinning out, but most of Mr. Hunnewell's specimens are open.

Mr. Harris did not know that they had two varieties of *Retinospora squarrosa*. He takes out a branch whenever he sees one that needs to come away. It would be an endless work to prune trees thirty or forty feet high every two years, and it would soon deprive them of their individuality; to preserve that they must be let alone. He expected, if he lived, to see *Retinospora squarrosa* twenty-five feet high, but the inner foliage would then have passed away, and we should have bare stems as we now have in white pines. He believes in high culture; in an azalea border, part of which was trenched and highly manured, the plants near the edge grew stunted as they sent their roots into the virgin soil. The same holds with all evergreens; they want high culture. The beautiful arbor-vitæ hedges at Wellesley are contiguous to highly cultivated borders, and he saw no reason why they should not go on for fifty or a hundred years. In England yew hedges are cut right back.

Charles M. Hovey did not think that there are two varieties of *Retinospora squarrosa*. Many of the coniferous trees, particularly arbor-vitæs, vary in foliage with age. *Retinospora ericoides* always does well until an unfavorable winter occurs, and then it is cut down. He had never had *R. plumosa aurea* injured. The other *Retinosporas* are very hardy. He had tried all the old varieties of conifers, and many were hardy in Mr. Hunnewell's ground, which is light, with a dry bottom, that were not hardy on his (the speaker's) ground. He could not get up the yews to any size. *Taxus Canadensis* (the American yew) is very beautiful, especially when full of berries. He had planted out *Abies Cephalonica*, and one, behind a holly hedge, where it is sheltered from the winter sun and cold, is now a fine specimen. He thought that Mr. Sargent and Mr. Harris were both right in regard to pruning, and he also agreed with Mr. Sargent that in future we should have, instead of places of several hundred acres, those of a few acres, planted with *Hydrangea paniculata*, *Viburnum plicatum*, *Retinosporas*, and other shrubs and trees of growth proportioned to the size of the place. The shears should never be admitted when landscape beauty is desired; if they are used, everything becomes alike, and the natural beauty of each tree is lost. Mr. Hovey questioned whether high manuring would not cause a sappy growth, more liable to be winter-killed, as in pears, peaches, and grape vines. In England the opinion is that fresh manure does not immediately injure the pine family. Mr. Hovey spoke of the

hemlocks in Maine, and said that when cultivated they should be protected from high winds. For real beauty this tree stands at the head of all evergreens, and should be planted more than it is, but it does not generally do well in England. He described a visit to Admiral Egerton's park of thirteen hundred acres, where he saw *Sequoias*, *Araucaria imbricatas*, and hemlocks—the latter growing as finely as in their native soil; but the Admiral said that such trees were very rare in England. Weybridge, where this park is situated, is all peaty soil. Hardy cyclamens were in flower there in the open ground on the 17th of April. They had little bright sun then, and by the time the sun got well up the frost would be out, while here the sun would strike and blacken the foliage of all plants not perfectly hardy.

Mr. Sargent said that he would not cut back every *Retinospora*, but only such as are in sight from the house, and would leave others to develop naturally. It is not generally understood here that in England purple beeches retain their color through the season. Would not the same cause produce the same effect on the barberry, filbert, etc.? His Norway spruces of forty years' standing had failed so much that he thought of cutting them down. He dresses his conifers with old manure once in three years, and the intervening years with soil. The *Cephalotaxus*, of which he has three species, grows so late that it should not be stimulated, but Norway spruces and cedars of Lebanon finish their growth early.

The Chairman said that for this climate we must make some exceptions to the trees and shrubs recommended in Mr. Parsons's paper. He (the essayist) recommended growing Japanese maples in pots. The *Acer Negundo* does well at Mr. Hunnewell's, but not generally. The varieties of *Acer polymorphum*, even *atropurpureum*, are all affected by our climate. If Mr. Harris speaks doubtingly of them we should be very cautious how we use them.

C. M. Atkinson said that the *Picea alba* or white spruce is a very magnificent tree, and should be in every collection. The *Abies Douglasii* had been mentioned as tender, but there is a fine tree in the late John J. Dixwell's place in West Roxbury; and on the estate of John L. Gardner, of which the speaker has charge, is a young tree which grew two feet in a season. Trees raised from California seed do not seem to be hardy, but those from Colorado seed are perfectly hardy. *Picea orientalis* is, without doubt, one of the most beautiful and desirable

trees. There is a very fine specimen at Mr. Gray's. On Mr. Gardner's place is an *Abies Cephalonica*, planted five years ago, which, though exposed to the sun, is perfectly hardy. It is sheltered from the northwest winds by a high bank. There is on the Dixwell estate a very fine plant of *Abies nobilis* about six feet high. At Dropmore Mr. Atkinson thought this species the finest thing he ever saw. *Abies Nordmanniana* and *Abies grandis* are also very fine and perfectly hardy. *Cupressus Lawsoniana* is generally considered tender, but on the Dixwell place is one fourteen feet high, and Mr. Sargent is propagating it. There are also on the same place several magnificent specimens of the American holly (*Ilex opaca*) from twelve to fifteen feet high and finely proportioned. Hoopes says that *Retinospora squarrosa* is not hardy, which is incorrect; it is perfectly hardy, and is getting common and deserves to be. The Irish juniper is a good thing, but it should have a few spruce boughs placed around it in winter.

Mr. Atkinson confirmed what Mr. Harris had said of the need of high culture for evergreens. In a plantation at the late John P. Cushing's place in Belmont, compost was distributed in trenches between the trees, and those manured were green and healthy while others were yellow. Mr. Gray's handsomest specimen of *Abies Menziesii* or *Picea pungens* is of so beautiful a blue as at once to arrest attention. The inner part of the foliage is brown, and the outer blue. The blue variety is called *Parryana*, and is destined to take the place of the Norway spruce. The latter is only adapted for planting on the outskirts of grounds. Now that there are so many superior species, to plant Norways shows either ignorance or very bad taste. Mr. Atkinson related an instance where a misty rain congealed on the branches of a Norway spruce, and a brisk wind coming on afterwards the branches were all rubbed bare. The specimens of tree box, on the north side of the house and under trees, at Pine Bank, the estate of Edward Perkins, on the border of Jamaica pond, present a very cheerful appearance.

The Chairman said that he had a specimen in a northwest exposure.

Samuel Parsons, Jr. said that he labored under a great disadvantage in not knowing what is hardy here and what is not. To decide this will be one of the great benefits of the Arnold Arboretum, which has one of the most enthusiastic arboriculturists in the country at its head. Every plant will have proper attention, and

we shall have a list of all the really hardy trees. Mr. Parsons said it was surprising what a quantity of trees and shrubs had been collected, and he advised all to go and see the Arboretum.

Mr. Hovey was surprised that the American holly, which grows within twenty-five miles of Boston is not cultivated. It is not as beautiful as the English species, but very nearly so. He imported one or two hundred trees from England, of which Mr. Dixwell, of Brookline, had four, and he had four or five left, which are now twenty-five years old and from twelve to eighteen feet high. It should be planted in large or small grounds. It is true that it is somewhat difficult to transplant. Mr. Hovey commended the Queen Victoria and George Peabody arbor-vitæs, from Western New York—the former tipped with silver and the latter with gold. Maxwell's Glory of the Spruces is golden on the upper side of the leaves; it is a slow grower, but otherwise like Menzies's spruce. These three are indispensable. The dwarf arbor-vitæs, such as Hovey's, Hoopes's Dwarf, and others, are desirable trees; as are also the dwarf spruces, such as *Gregoryana*, *pumila*, *Clanbrasiliana*, etc.

Mr. Sargent confirmed Mr. Hovey's opinion of the value of the Queen Victoria and George Peabody arbor-vitæs and Maxwell's spruce, but said that *semper aurea* is even a better arbor-vitæ than George Peabody. *Picea orientalis* is one of the finest trees on his place; it has small dense foliage. He saw no reason why the American holly should not be grown, but it is seldom planted by nurserymen. Mr. Meehan, who raised some at the request of the speaker, said there was no demand for them. Every one who begins now should plant a holly hedge, and purple beech and blue spruce trees.

Mr. Harris said that the best holly at Wellesley was exposed to the north wind.

Benjamin G. Smith said the holly grows finely at Cohasset.

Mr. Hovey said that he had a fine specimen of *Picea orientalis*, but that the trees are rather scarce and people are not aware of their beauty. It is a slow grower; a Norway spruce would grow ten feet while *Picea orientalis* grows three. If there was a demand for it, it would no doubt be supplied. If American hollies could be sold by the thousand they could be afforded at low rates.

Mr. Sargent recommended the *Picea Pinsapo;* the leaves are all recurved, and it is perfectly hardy.

Mr. Hovey said it is not hardy in Massachusetts.

The Chairman said that it had not flourished with him.

J. W. Manning said that his *Picea Pinsapo* looked bright. He has had the Douglas spruce for some years, and finds it adapted to this latitude. Lawson's cypress is not hardy with him. He saw *Abies grandis* at Rochester; it is of very slow growth, very stocky at the base, and the branches are very thick. *Retinospora squarrosa* is of thrifty, upright growth. *R. ericoides* went through the winter well. All *Retinosporas* should be shortened in annually, to keep an entire green surface. If this is not done the foliage of previous years will show red and unsightly. The green *Euonymus Japonicus* stands the winter perfectly at Gloucester.

The Chairman thought that the Japanese maples would be of little use here. While the *Retinospora aurea* is very desirable, the golden spiræa produces a much stronger effect in summer. We desire sunlight most in dark weather, and this plant gives a sunlight effect in the darkest days. The speaker was much pleased with the effect of the golden pyrethrum which he saw in England, in lighting up the beds, and a hedge of golden spiræa which he has planted is as bright as the pyrethrum. If clipped it will retain its color through the season. The purple beech may be planted when a dark effect is desired. We want to bear in mind the plants which grow with ease.

The Chairman suggested the appointment of a Committee to prepare a list of new trees and shrubs which could be recommended for planting here.

Mr. Hovey said that such a list, with the results of the experience at Mr. Hunnewell's and Mr. Sargent's, would be of much value, but the climate of Fishkill is very different from that of Boston, as are also the conditions of soil. Many trees hardy at Fishkill and Wellesley are not so in the strong, moist soil of his (Mr. Hovey's) ground.

The Chairman announced that on the next Saturday Mrs. C. N. S. Horner would read a paper on native plants.

MEETING FOR DISCUSSION.

SATURDAY, January 31, 1880.

A meeting for discussion was holden at 11 o'clock, William C. Strong, Chairman of the Committee on Publication and Discussion, presiding. The following paper by Mrs. C. N. S. Horner, of Georgetown, Mass., was read by the author. This was the first instance in the history of the Society of the reading of a paper by a lady; and the ladies (of whom there was an unusual number) and gentlemen present were much interested and gratified.

NATIVE PLANTS.

I do not come before you today with any learned essay on the science of botany, or any new theories concerning the phenomena incident to the vegetable world. But I am glad to have the opportunity to speak to these flower-lovers a few words in commendation of the trees, shrubs, and flowering plants growing spontaneously and making the world around us beautiful without care and labor from gardener or florist.

My knowledge of plants is largely practical, and the natural outgrowth of an inborn love of nature as we find it in our fields, woods, and meadows—although when learning the rudiments of the science in my school-days, I also received from my teacher another lesson which has been of life-long value to me. This was, that while comparatively few could become thorough botanists like "the great Linnæus," as she loved to call him, yet to the many was accorded the privilege of becoming acquainted with the properties, habits, and homes of our native plants and of learning from companionship with nature in its various forms, that which books alone could but partially teach. Thanks to her wise directing I have studied the book of Nature for the most part in this way, and have come to know—I cannot tell when or how—much of wild-flower lore, and from the time of the first opening buds of *Epigæa* and *Hepatica*, till the November sun lights up the pale golden petals and tawny fruit of the *Hamamelis*, there is for me a charm in each successive page of this book which makes it impossible that it shall ever grow wearisome or old; and I would that those who have hitherto found the study of botany dry and uninteresting

might, through one flowery summer, as opportunity offers, go with book and microscope to the sunny fields and cool woodlands, and see the wild flowers in their own haunts with their harmonious surroundings, and I am sure that text-books would no longer seem collections of unmeaning phrases and names hard to be remembered, but rather the initiatory training necessary for the better understanding and enjoyment of a field of research, in a measure accessible to all, and in which some of the highest capacities of the soul may find scope.

I would say, in passing, that there are many advantages in giving to each flower its botanical name, and the surest way to be able to do this is to see the flower itself and thus associate the two. There is often much misunderstanding caused by the many local names given to the same flower. For instance: several ladies were one day discussing the merits of my fernery. One said, "O, that foxglove has blossomed;" another said, "What do you call foxglove?" And when it was pointed out to her, she said, "That is hunter's cup; the foxglove is a very different thing; it has a blue flower that never opens, but always resembles a bud."

It would be a tedious and well nigh impossible task to enumerate even the more rare and desirable among the native plants of our own State, for those conversant with the out-door world know that during the warmer months of the year each day offers something peculiar to itself; each locality has floral treasures of its own.

"Not alone in meadows and green alleys,
On the mountain-top, and by the brink
Of sequestered pools in woodland valleys;
* * *
Everywhere about us are they glowing,
Some like stars, to tell us Spring is born;
Others, their blue eyes with tears o'erflowing,
Stand, like Ruth, amid the golden corn;
Not alone in Spring's armorial bearing,
And in Summer's green-emblazoned field,
But in arms of brave old Autumn's wearing,
In the centre of his brazen shield."

And even in midwinter the landscape is enlivened by a variety of evergreen trees and shrubs, and in the forests the lichens, mosses, and lycopodiums are always fresh and beautiful. Then

the manner of growth, the different forms of buds, and the variously colored twigs and barks of deciduous trees, are more noticeable at this season, and might furnish to botanical clubs and classes a profitable subject for study when field meetings and outdoor rambles are no longer possible. I have brought in today a few specimens showing that winter woods and waysides may always furnish something of interest.

Among things of a practical nature that have grown with my years of companionship with the wild flowers, is the conviction that many of our local plants and shrubs would be valuable acquisitions to our gardens and conservatories, comparing favorably with a large number of our cultivated flowers; indeed I find that many of the plants of New England gardens are the wild flowers of our Western States. I have received during the past season a collection of pressed specimens found in the mountains and cañons of Colorado, and among them I recognize many of our garden flowers, such as Delphinium, Chrysanthemum, Coreopsis, Aquilegia, Phlox, and others. I think we have many herbaceous plants just as worthy of a place in our gardens. We have also many shrubs and small trees, beautiful in flower and fruit and gorgeous in autumnal foliage, which might be admitted to our cultivated grounds with good effect. Most of our native ferns, too, may be easily brought under cultivation, adding very much to the grace and elegance of our gardens. The smaller species are admirable for in-door culture, and, in company with other wood plants, make charming winter gardens for shady corners and northern windows, where beautiful exotics and delicate plants that need sunshine will not be successful. Some of our native plants have been reclaimed, and have already a well established position as both ornamental and useful, and I think there is an increasing interest in this matter which will doubtless result in a wise selection of those plants that will best minister to our pleasure and profit, thus utilizing another of the good gifts of a beneficent Providence.

This subject is one of many aspects of Nature which are full of interest to inquiring minds—the great variety of forms of leaves, flowers, and fruits, the perfumes, the ways in which plants are perpetuated and disseminated, their relations to other forms of life, etc.; but I will not dwell longer upon it. I would say in conclusion that if we would truly understand and love *Nature*,

while gratefully accepting the aid afforded by the investigation and study of those further advanced than ourselves, we should meet her face to face, asking for that revelation of herself by which she may accomplish her mission of good to our race, in its broadest sense, giving to us truer ideas of the creative power and goodness of Him who has "made everything beautiful in its season."

Discussion.

The Chairman said that Mrs. Horner's paper seemed to fall into line with the subject discussed on the two previous Saturdays. Mr. Parsons dwelt on many new shrubs which might require to be cultivated in pots, but the plants mentioned by Mrs. Horner are all hardy here. The Chairman called on E. H. Hitchings, as a lover of native plants.

Mr. Hitchings said he was glad that Mrs. Horner had recommended the cultivation of our native trees and plants. Mr. Hovey last Saturday recommended the cultivation of the American holly, and of this the speaker said he had seen beautiful specimens at Cohasset, twenty-five feet high and covered with fruit. He also advised the cultivation of the *Taxus Canadensis* or American yew, as one of the handsomest dwarf evergreens. He spoke of a remarkably fine specimen of the hemlock, at West Dedham. Among other native shrubs which deserve a place in our gardens are the *Viburnum Opulus*, *V. lantanoides*, *Kalmia glauca*, *Ledum latifolium*, *and Andromeda polifolia.*

Most persons think that during the five cold months, Nature is at rest. Even Col. Higginson, in his "Out-Door Papers" (page 321)—a book which every lover of Nature should read—says, "After exhausted October has effloresced into witch-hazel, there is an absolute reserve of blossom, until the alders wave again" in March. But, taking a series of years, the speaker had found flowers in blossom every month in the year:—January 11th, 1874, hepaticas; 15th, 1878, *Senecio vulgaris;* 27th, 1870, willow catkins; 28th, snowdrops and crocus; February 3d, 1867, snowdrops; 27th, 1868, willow and alder catkins; 28th, hepaticas; March 7th, 1880, hepaticas; 17th, 1873, *Senecio vulgaris;* 19th, 1871, hepaticas; 20th, 1868, willow, and alder catkins; 24th, 1878, hepaticas; 25th, 1871, alder, willow, and poplar catkins; 30th, 1878, hepaticas and alder and willow catkins; 31st, 1871, *Draba verna;* November 5th, 1871, *Geranium Robertianum;* 9th, 1879, hepaticas, *Viola*

Canadensis, and dandelions; 13th, 1872, *Geranium Robertianum* and *Corydalis glauca;* December 2d, 1869, witch-hazel, may-weed, chickweed, and shepherd's purse; 2d, 1879, hepaticas; 16th, and 25th, 1877, dandelions.* These instances show that Nature is always at work; there is no cessation. If you go out and examine the alder catkins in midwinter, and examine them again ten or fifteen days later, you will see that they have grown considerably.

Mrs. Horner added to the list of native shrubs desirable for cultivation the *Clethra alnifolia* and *Potentilla fruticosa*, the latter a very handsome shrub, blooming through the season.

The Chairman and others mentioned the *Ilex verticillata*, or black alder, which grows naturally in rather moist soils, and bears bright red berries, as desirable for cultivation.

Benjamin G. Smith said this shrub would thrive in any good garden soil, as would also the beautiful and fragrant pink swamp azalea.

Mr. Hitchings said that the case is the same with the *Calopogon*, which he had found growing in dry, sandy loam, though it usually grows in swamps. The *Cornus florida* is very desirable for gardens. There is a very fine specimen on the lawn at C. S. Sargent's residence in Brookline.

The Chairman mentioned the *Ilex lævigata*, and added that the *Clethra* is desirable not only for the beauty and fragrance of its flowers, and for its handsome foliage, but because it flowers at a time when few shrubs are in bloom.

Leander Wetherell said that for twelve or thirteen years he was required to note the time of flowering of the earliest blooming tree, shrub, or plant. This was at Rochester, N. Y., and for miles

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* Since this meeting Mr. Hitchings has added the following note: For twenty months in succession, viz., from April, 1879, to November, 1880, inclusive, wild flowers have been in bloom every month in the vicinity of Boston. In Chelsea, November 9th, 1879, hepaticas and *Viola Canadensis;* in Georgetown, December 2d, hepaticas, found by Mrs. Horner; in Danvers, January 10th, 1880, *Draba verna*, by John Sears; in Chelsea, January 29th, hepaticas; in Melrose, February 29th, 1880, hepaticas, by S. B. Stebbins; March 4th, in Danvers, hepaticas and *Draba verna*, by Mr. Sears; in Chelsea and Melrose, March 7th, 1880, hepaticas; in Chelsea, November, 1880, *Viola pubescens*, and hepaticas; in Melrose, November 14th, *Geranium Robertianum* and ranunculus.

around that city there was hardly a tree or shrub but he knew and watched it. He found the red maple one of the best indicators of the season. It was noticed that yesterday (January 30th), they advanced in some localities. Professor Dewey called double flowers monstrosities. You cannot tell anything about a flower when you have bred all nature out of it. The botanists of the garden are not in accord with this opinion. Mr. Wetherell agreed with the essayist in regard to the difficulty of identifying plants by common names, while botanical names are the same the world over. To illustrate the misleading nature of common names, he spoke of the blue grass of Kentucky (*Poa pratensis*), the blue grass of the botanists (*Poa compressa*), and the June grass or white top of farmers (*Danthonia spicata*), three distinct species, which are all known by the name of June grass.

Mr. Hitchings alluded to Mr. Tailby's *Cypripedium insigne* with two flowers on a stalk, and said that he had found the wild *Cypripediums*, *acaule* and *pubescens*, growing in the same way, and also the *Arethusa bulbosa*.

John G. Barker spoke of the growing interest in the cultivation of native plants. At the fair of the Essex Agricultural Society at Lynn last fall, Cyrus M. Tracy exhibited a collection of native plants, labelled both with the botanical and common names, and Miss Tracy a fine named collection of native ferns and also one of native fruits, which added much to the interest of the show. The collection exhibited by Mrs. Horner today reminded him of what he saw along the road, in a drive from Lynn to Salem a few days since. There was something interesting all the way—ferns, lycopodiums, cranberries, etc.

Mrs. H. L. T. Wolcott asked if no one had anything to say about the buttercup. The popular song gave value to the flower and made its beauty appreciated.

Fearing Burr thought a more absurd collection of names than the common names of plants could not be found. Many of them are only local, and are unreliable. He had brought together all the native asters he could collect, some of which are exceedingly beautiful. He had also made a collection of golden rods, of which the marsh golden rod (*Solidago sempervirens*) is particularly beautiful. One of our native violets propagates so rapidly when cultivated in the garden as to become a troublesome weed.

Miss E. M. Harris spoke of a mountain ash with unusually large

berries, and said that Mrs. H. D. Wilmarth has a mountain ash, brought from the White Mountains, which bears uncommonly fine berries—larger here than in its native place.

C. M. Hovey thought the purple Rhodora, in regard to which an inquiry had been made, had not been much cultivated, but said that it grew wild abundantly on his grounds before they were cleared. He recommended the *Asclepias tuberosa* as one of the most beautiful native plants, and readily cultivated. It blooms in August.

A lady spoke of the *Amelanchier* or shad bush as desirable for cultivation.

The Chairman said that Mrs. H. L. T. Wolcott cultivated the maiden hair fern and the *Viola pedata bicolor*.

John B. Moore said that the maiden hair fern would grow in any partially shaded place.

Mrs. Horner said that Samuel P. Fowler, of Danvers, a lover of native plants, had cultivated the *Asclepias tuberosa*. She had herself cultivated the cardinal flower, but it would not do well for more than two years. She exhibited shoots of the tupelo (*Nyssa*), a tree of moderate growth, and remarkable for the rich color of its autumnal foliage.

Mr. Hovey said that he had trees of the tupelo twenty years old and twenty-five feet high, which he raised from seed. When cultivated it is more beautiful than in the forest. Few trees surpass it; the texture of the leaf is like that of the camellia, and in autumn it is like a tree of fire. It is at all times and in all places one of the most beautiful trees. The cardinal flower grew naturally in his ground, which was very rich in native flowers; he had gathered two hundred species there. It was broken up and reclaimed in 1848, and eight years ago the *Lobelia* appeared around the holes where trees had been taken up, and he saw it last year in similar situations. The old English authors gave directions for cultivating it.

The chair was here taken by Rev. A. B. Muzzey, of the Committee on Publication and Discussion.

Mr. Hitchings thought the sweet briar was indigenous. Bartholomew Gosnold found it at Martha's Vineyard in 1602.* Mr. Hitchings spoke of the *Potamogeton Robbinsii*, as remarkable for the paucity of its seeds; only one had been found in fifty years,

* Mass. Hist. Soc. Coll., Third Series, Vol. 8, pp. 76, 77.

and it is a question among botanists how the plant is distributed.*

John C. Hovey asked whether *Sempervivum tectorum* is indigenous here.

John B. Moore had seen it in Sudbury; George Hill in Arlington; Leander Wetherell in the western part of Worcester county, and Robert Manning in Swampscott. In every case it was on ledges, and was not indigenous but had evidently been introduced.

E. W. Buswell said that not only the *Sempervivum tectorum*, but the *Sedum Telephium* or Aaron's rod is called houseleek.

John C. Hovey said there are a number of native *Sedums*.

Mr. Strong remarked in allusion to a specimen of the Baroness Rothschild rose, exhibited by him, that it had been confounded with the Baron Rothschild, both in this country and in Europe. One of the most reliable French nursery firms has sent out the Baroness instead of the Baron, but they are entirely distinct. The latter is darker than the former and the wood is entirely different.

The specimens exhibited by Mrs. Horner comprised three species of *Cornus—stolonifera*, *sericea*, and *alternifolia*, with bright red and purple barks; the red cedar, bayberry, *Gaultheria*, and *Mitchella* in fruit; the tupelo with its smooth gray shoots; the hazel nut and alder with their catkins; a poplar with varnished buds, and willows showing their silky catkins; glossy hemlock, and white and pitch pines; *Ostrya Virginica*, sassafras, witch-hazel, *Amelanchier*, alder, wild rose, white and yellow birch, blueberry, *Lycopodium complanatum*, *L. dendroideum*, *L. clavatum*, and *L. lucidulum; Botrychium*, and other ferns; *Goodyera pubescens* and *G. repens; Pyrola*, pepsissiwa, *Arctostaphylos*, cranberry, and others, each with a beauty of its own, and showing that winter woods and waysides may always furnish something of interest.

The Chairman gave notice that on the next Saturday William D. Philbrick would read a Prize Essay on the Profits of Farming and Gardening in New England.

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* Since this was said it has been found in fruit at Jamaica pond, by Edwin Faxon.

BUSINESS MEETING.

SATURDAY, February 7, 1880.

An adjourned meeting of the Society was holden at 11 o'clock, President Hayes in the chair.

The following vote, offered by John B. Moore, and seconded by William H. Spooner, was unanimously passed :—

Voted, That the Library Committee be directed to examine and report at the next meeting of this Society, some suitable plan by which this room can be made more convenient and better adapted for the uses of the library and meetings of the Society for the transaction of business and for the purposes of discussion and exhibition.

The Secretary announced the receipt of a letter from Mrs. S. A. Hall and Mrs. G. A. Hall, gratefully acknowledging the resolutions passed by the Society in memory of their father, the late Josiah Newhall.

The following-named persons, having been recommended by the Executive Committee, were on ballot duly elected members of the Society :—

BENJAMIN F. BUTLER, of Lowell.
GEORGE B. LORING, of Salem.
DAVID N. SKILLINGS, of Winchester.
CHARLES F. CHOATE, of Cambridge.
GEORGE O. CROCKER, of New Bedford.
ALFRED W. PAUL, of Dighton.
CALVIN W. SMITH, of Grantville.
JOSEPH R. LEESON, of Newton Centre.
AMOS HILL, of Belmont.

Adjourned to Saturday, February 21.

MEETING FOR DISCUSSION.

Immediately after the adjournment of the business meeting, a meeting for discussion was holden, at which the following Prize Essay was read by the author, William D. Philbrick, of Newton Centre, Mass. :—

The Profits of Farming and Gardening in New England.

A popular writer (Peter Henderson, in "Gardening for Profit," page 16) very aptly says of this topic, that "it is a rather difficult, if not a delicate matter to touch, as the profits are so large, in some instances, as almost to exceed belief, and so trifling under other conditions, as hardly to be worth mentioning."

The subject is a difficult one for other reasons; for it is well known that most men, especially successful men, are willing to speak of almost any subject with more freedom than of their profits or losses. If a man meets with remarkable success in any particular direction, he is very apt to keep it to himself for fear of competition from others, and if he meets with serious loss, he is still more likely to hold his tongue, from fear of injury to his credit as a prudent manager. Some, indeed, of boastful disposition, will tell wonderful stories of their profits, but those who are willing to state, freely and truthfully, the result of their toil, are rather rare exceptions to the general rule.

The profits of farming in New England are in general very small, except in certain specialties, which shall be mentioned below. Since the completion of our railroad lines extending over the vast and fertile prairies of the West, and since the establishment of steamboat connections with the early and productive gardens of our middle and Southern States, we are forced to compete with the industrious farmers of these distant regions, in supplying our markets with produce of almost every description. True, the distant farmer must submit to many expenses, such as freight, insurance, commissions, and even loss of perishable goods in transit; but these are in many cases more than counterbalanced by the cheap and fertile lands, the milder climate, and cheaper labor of those regions.

The tiller of the stony hill-sides and sandy plains of New England finds little to encourage him in competing with the West in the production of the great staples, such as corn, wheat, beef, and pork; or with the southern and middle States, in the production of such early fruits and vegetables as admit of easy transportation. Our early strawberries, peas, and even potatoes and tomatoes, come to a market that has been already several weeks satisfied with southern supplies.

The farmer of New England is thus driven to the production of

articles which will not bear transportation from long distances, such as fresh milk and eggs for the city markets; fresh vegetables and fruits of a perishable nature, like lettuce, celery, cauliflowers, and others; or of a bulky character, such as cabbages, rhubarb, spinach, and other garden greens.

It is generally admitted that corn can be grown in New England at a cost of from forty to fifty cents a bushel, and it is common for farmers to raise what they wish to feed on the farm; but the limited area of good land, and the need of manure, prevent it from being grown for sale.

Experiments are now in progress in Maine and elsewhere upon the production of beet sugar, with some prospect of success. The sugar beet, with good culture, yields from twenty to forty tons per acre, which are bought at six dollars per ton at the sugar-works. The refuse pulp is a valuable fodder for cattle, worth about one-third or one-half the price of good English hay. The beets yield about eight per cent. of sugar.

The progress of this experiment will be watched with much interest by the farmers, who are looking earnestly for something to which they can profitably turn their hands. Wherever beet sugar-making has been introduced in Europe, it has increased the productive power of the soil, and improved the condition of the farmer.

The profits of gardening are, in general, much larger than those of farming. The reason for this is to be found in the larger capital required and the greater skill needed to produce the best results. The best vegetable gardens near Boston are worth $1,000 or more per acre. They are worked by a very energetic and skilful class of men, who use a floating capital of $500 or more per acre, invested in teams, hot-beds, tools, manure, etc. The force used upon such gardens is about one man for every acre in summer, and the amount of manure twenty to thirty cords per acre, every year. The sales, under favorable circumstances, amount to over a thousand dollars per acre.

There are many instances, known to the writer, of men who began life with no other capital than a brawny arm and an active brain, who have worked up, in this pursuit, to the ownership of valuable gardens, besides a handsome property in personal estate. One of the most remarkable of these men states, that the yearly profit of his whole garden of twenty acres reached an average of

$400 per acre for six consecutive years, or an annual profit of $8,000. This was, however, several years ago, when the competition from the South was less active than at present. Probably the present profit, under the same management, is considerably less. This, too, is to be regarded as an extreme case—a rare combination of skill, energy, and ample capital. Where one such man as this is to be found, there are scores of others less successful, besides many who earn but a poor living by severe toil.

Small fruit growing is profitable when followed with industry and energy. But as less capital is required, and as the crop can easily be marketed by railroads from a distance of fifty miles or more, the competition is sharper and the margin for profit less than with vegetables in general. A profit of from two to three hundred dollars per acre in this business is considered very satisfactory. Currants, upon good land and well cared for, will yield, at present prices, about fifty cents per bush, or nearly a thousand dollars per acre, and are a reasonably sure crop. Strawberries, raspberries, and blackberries, all deserve more attention than they have received in New England. These fruits come in large quantities from New Jersey, excepting raspberries, which are too tender to bear transportation from a distance, and are therefore especially suited to our neighborhood.

Grapes are not so much in favor with the producer here as in former years, experience proving them very uncertain here as compared with the lake shores of New York State, which region supplies us very cheaply.

The profit or loss in farming or gardening depends somewhat upon soil, location, and other circumstances; but far more upon the character of the man who undertakes it. Accidents of the seasons, such as frost, hail, or tornado, may sweep away the profits of a single season; but, in the long run, prudence, industry, and well-directed enterprise will surely reap a fair return, while a want of these qualities just as surely works the ruin of the farmer or gardener.

Farming and gardening also should be regarded as a sort of trade, requiring for success a certain apprenticeship before one can expect to succeed in mastering its many details. In general those who are most skilful were brought up as farmers from their boyhood.

Discussion.

Benjamin P. Ware said that the essayist had alluded to the experiments in the manufacture of sugar from beets, now in progress in this country. The subject is one which he felt to be of great importance to the farmers of Massachusetts. It is important to understand the profit of the manufacture. He had been informed that the pressed pulp was of more value per ton for feeding purposes than the whole beet. The raw beet contains ninety per cent. of water, and the pressed pulp the same. It is said that the pulp is not pressed very severely, and if this is true it cannot be of much value. The success of the manufacture must depend very much on the value of the pulp for feeding, and he was not prepared to think it worth half as much as English hay.

Mr. Philbrick said that the pulp is so bulky after pressing that it will not pay for transporting long distances, but if the farmer when he brings a load of beets could carry back a load of pulp it might pay. He thought farmers would find they cannot afford to pay much freight on either roots or pulp.

O. B. Hadwen said that in the process of manufacture the beets are mashed and hot water is added. He had fed beets to cattle but had had no experience in feeding pulp. He thought three tons of pulp and one ton of hay might be equal to two tons of hay. The Lancaster farmers say that the freight of pulp is an obstacle to the success of the manufacture, and the true way is to have the factory near the farms where the beets are grown. He had no doubt that the manufacture would be of advantage to farmers, as it would open to them a wholesale market for their products. The interest of the farmers and factories should be mutual. The speaker thought that the appearance of the farmers and gardeners at the meeting indicated that there was a reasonable profit in their labors. Farmers here should cultivate such crops as the West cannot compete with.

Leander Wetherell spoke of a disease of beets in France, which had caused some alarm among growers. In that country most of the pulp is fed by the proprietors of the factories to large herds of cattle which they keep for that purpose. The cost of freight to any considerable distance would eat up the value of the pulp. The Chemist of the United States Department of Agriculture says that Indian corn and amber cane each gave a larger percentage of sugar than beets.

Mr. Ware said that owing to the cost of freight of beets and pulp the success of sugar manufacture must depend on the factory being in the midst of the farmers. The plan of the manufacturers, raising the beets and owning the cattle proved a total failure in the West. It requires thousands of acres, and a company cannot grow them successfully; it must be done in a small way. Extracting the saccharine matter does not lessen the feeding value of the beets much. The speaker supposed the pulp to be a concentrated article of food. The Chemist of the United States Department of Agriculture has told enormous stories in regard to sugar from Indian corn and amber cane. Professor Goessmann says it is impossible to make sugar profitably from amber cane, for it can only be made when the cane is in a peculiar condition which lasts but from ten to fourteen days, and a factory costing, say $100,000, cannot be allowed to lie idle a large part of the year.

J. W. Talbot said that the agent of the factory at Portland stated that he had the produce of from 2,000 to 3,000 acres of beets, and that he could afford to pay six dollars per ton for them. At Newburyport the average product of several growers in 1879 was twenty-five tons per acre; in other places it was much less. Five tons of beets make one ton of pulp, which sells for four dollars, and farmers bring in beets and carry back pulp. The crop must be rotated with others, taking only one crop of beets in three years, and hence 2,000 acres of beets presupposes 6,000 acres of land. Before a factory is established it is necessary to be certain that a permanent supply of beets can be procured. The speaker had no doubt that if properly managed the manufacture would be successful, but too many managers would cause failure. If Professor Goessmann's statement is true, that fertilizers will supply what is taken away by the beets, the necessity of rotation is obviated, but this is too sanguine a view to take.

Mr. Philbrick said that rotation is not necessary with beets in the same sense that it is with cabbages. Market gardeners pull their beets early, and he had known two crops taken from the same ground in one year.

Mr. Wetherell quoted Liebig's remark, that rotation is less desirable than the ability to raise the same crop year after year on the same soil; and said he hoped we might gain this ability. Onions were raised continuously on the same land for seventy-five years until the onion maggot interrupted.

Mr. Ware said that he might have misunderstood, but, that Mr. Bowker was his authority for the statement that in the manufacture of sugar, the beets are crushed or ground, and put in hot water, and that as much water was left in as there was juice taken out.

William C. Strong asked if so much saccharine matter could be taken out of the beets without lessening their value for feeding.

Mr. Strong, as Chairman of the Committee on Publication and Discussion, gave notice that the discussion would be continued on the next Saturday, with special reference to the Profit of Small Fruit Culture, and that Mr. Talbot would, at an early day, present a paper on Peat and Peat Lands. Also, that Dr. Sturtevant proposed to give facts which he had collected in regard to the Influence of the Stock on the Graft, and would be glad to learn such facts from the members present, or others.

MEETING FOR DISCUSSION.

SATURDAY, February 14, 1880.

A meeting for discussion was holden at 11 o'clock, William C. Strong, Chairman of the Committee on Publication and Discussion, presiding. The subject assigned was a continuation of that of last week; "The Profits of Farming and Gardening in New England," with special reference to the culture of small fruits; but, before taking it up, Cephas H. Brackett, who had on exhibition some fine tomatoes and mushrooms, was requested to say something of his method of cultivating them.

Mr. Brackett said that he had about a hundred pots of tomatoes; the seed was sown in July, and he gathered fruit the last of December. Some of the pots were set on the ground and the plants rooted down into it, and these did best and continue to bear, but those in the ground did not produce as handsome fruit as those on the shelf. The plants are much shaded and run up so as to touch the glass, and every cold night the tips are frozen, which seems to benefit them, producing much the same effect as pinching. Some of his plants failed at the root, and those he cut down, and they bid fair to bear another crop. They did as well in six-inch pots as in nine-inch. He watered with Cochituate water directly from the

hydrant; some which were watered with pretty strong liquid manure failed first.

He made his mushroom bed with about eight inches depth of manure, and in about two weeks covered with two inches of loam. He did not cover it with straw, but left it exposed to the light. It was in a house with cucumbers, where the temperature varied from 40° to 90°, and partly under the cucumber beds, but not much shaded. He was sometimes successful, and sometimes not, but had never made it profitable. The price is sufficient, but the beds have not produced enough. He once covered the beds with straw. He did not put forth the method he had described, as the best, but merely such as it was convenient to him to practice. His cultivation of tomatoes was incidental to other matters, and if he were going to make a business of cultivating them, he would give them a warmer place, and away from the glass.

The Chairman said that he had had the same difficulty with tomatoes, which he sowed in November, as Mr. Brackett had experienced. The plants were in the same house with roses, and, at first, he thought it might be owing to smoking the roses, but afterwards concluded it was not. He believed now that it was owing to watering with cold water, for the tomato luxuriates in warmth, and cold water would check its growth. Later he watered with tepid water and the plants improved. There is no difficulty in the setting of the fruit, if we can avoid disease. When the plants were turned out, the pots were found full of vigorous roots, and he was not clear what the disease was; the roots might not be healthy when they appeared so. The temperature of the soil was no higher than that of the air in the house. He did not see the advantage of planting in beds; it would be cheaper, and the plants would be less liable to injury by watering with cold water, but it would tend to excessive luxuriance.

C. M. Hovey remarked that Peter Henderson says cold water does no injury, whatever, but it depends somewhat on what plant it is applied to. Mr. Knight said pineapples could be grown without bottom heat, and it can be done, but not to advantage. He did not believe that tomatoes could be successfully grown in a soil the temperature of which was no higher than that of the atmosphere.

William D. Philbrick said that when the temperature of the air varies from 40° to 90° in a bed without bottom heat, that of the soil

would range from 50° to 70°. He did not see how to get high soil temperature without too much expense for tomatoes.

Mr. Hovey said we shall fail if we undertake to grow tomatoes or orchids without expense. It is easy to regulate the temperature of a well-ventilated house, and the temperature of the soil could be made to correspond to that out-doors, which, in August and September, when tomatoes are ripening, is from 60° to 65° at night, when that of the air is 45°. Lettuce with high top heat, but no bottom heat, would damp off, and the trouble is probably the same with tomatoes. He planted tomatoes in pots in November, and potted in seven-inch pots, and trained to one stem. One was planted in the ground, and others were plunged, and at the time of speaking, all were growing freely, and were full of flowers. They are in the rose house, and the stems are eight inches from the pipe. He waters all but rare stove plants from the hydrant.

The Chairman thought it desirable to keep the roots of tomatoes warm, but not essential. Last year he succeeded finely, with care as to watering with tepid water.

Mr. Philbrick thought the trouble with the forced tomatoes was the same as had been seen in fields for the last ten years. The appearance resembles that of potatoes when they have been struck by rot.

The Chairman agreed with Mr. Philbrick, and thought it more apparent than at first that the trouble was not caused by want of bottom heat.

The Chairman called attention to a rose exhibited by him, which he had received from two respectable sources as the Oxonian, but was not sure that it was true. It is exceedingly floriferous; almost every joint seems to throw a bud. The Oxonian is described in the "Floral Magazine," Vol. XV., plate 219.

James Comley thought the rose shown by the Chairman was not the Oxonian; the petals are not cupped or smooth and even as in the true kind, which has two distinct colors and very short prickles.

The special assignment for the day, the Profit of Small Fruit Culture, was then taken up, beginning with raspberries. The Chairman called on O. B. Hadwen, Ex-President of the Worcester County Horticultural Society, for the views of growers in that part of the State.

Mr. Hadwen said that at Worcester the Northumberland Fill-

basket is highly approved. It is productive and profitable when well treated, and, though not of the highest quality, its form and substance make it desirable for market. He was uncertain about the Hornet; prize specimens which he saw here appeared to be identical with the Belle de Fontenay received from Mr. Meehan. Mr. Hovey had stated that the Belle de Fontenay had been disseminated as Hornet. The Herstine is giving good satisfaction, as are also the Knevett's Giant and Brincklé's Orange. The Brandywine is on trial. The Clarke and Philadelphia are desirable when hardy kinds are wanted. When the thermometer on high grounds indicates five degrees below zero, in valleys it will often be thirteen degrees below zero, and hence cultivators give different accounts as to hardiness.

Benjamin G. Smith said that of four or five kinds which he had cultivated as an amateur, the Franconia had been most successful. He had grown it for twenty years in the same place, and it continues as good as when first planted.

J. W. Manning had cultivated the Cuthbert for two years and found it a strong, vigorous grower; the flesh is firm and it ripens rather late. It is not remarkable for quality, but is a good market fruit. He had known the Hornet for fifteen years, and thought it and Belle de Fontenay identical. The largest berry he had ever seen was the Franconia; this variety has been known for more than forty years, and he questioned whether there had been any improvement in red raspberries in that time.

C. M. Hovey could recollect raspberries for forty years, and thought Knevett's Giant the best. The Philadelphia fruits so abundantly that it looks as if there was a bushel on a hill, but the fruit is so small that a boy after picking an hour could not get more than a gill. Dr. Brincklé raised twenty varieties, of which only the Orange is now cultivated. E. P. Roe, of Cornwall-on-the Hudson, exhibited some new varieties here, but they were not equal to the Knevett's. In answer to an inquiry, Mr. Hovey said the Knevett's Giant is a good bearer.

E. P. Richardson thought Mr. Hovey was rather too hard on the Philadelphia. A friend of his in Windham, N. H., who tried everything, discarded all but Philadelphia and Mammoth Cluster. The Philadelphia does not sucker badly, and is of remarkably fine color when canned, which is very much more attractive than the faded color of most kinds. The speaker thought the Hornet, Belle

de Fontenay, and Narragansett were all of the same family, and that they reproduced themselves from seed.

Mr. Hadwen said that the Knevett's Giant is a good bearer, but somewhat apt to crumble in picking. The Philadelphia is one of the best for preserving, especially when mixed with currants, and, though not of the high quality of Knevett's Giant, is desirable for those who will give it only ordinary cultivation.

The Chairman said that the Henrietta raspberry, introduced by G. H. & J. H. Hale, of South Glastonbury, Conn., resembles the Belle de Fontenay, but is worthless, and should have been described as it was. It is not prolific. The Pride of the Hudson is not worthy of introduction into New England or anywhere else. It blights in the sun.

Mr. Richardson said that the Herstine is very handsome, and of better quality than the Saunders. It is almost but not quite hardy; the tips are liable to be winter killed.

Josiah W. Talbot had plants called Hornet, which were thought by Mr. Hadwen and others to be Belle de Fontenay. One row bore as much as three of the Clarke. Where the Belle de Fontenay was killed to the ground, new shoots sprang up from the roots, which bore abundantly till frost. He had found the Herstine hardiest. He has given up strawberry culture and gone into raspberries, because the latter require so much less labor in cultivation. It is more work to pick and market them, but they bring better prices.

C. M. Hovey thought the Belle de Fontenay had been rather abused. It is hardier than an oak, and he could not get them out of his ground when they once got in. He set it down as not worth growing, but saw some in an amateur's garden, in September, under the name of Hornet, with stems four feet long, loaded with fruit, so that he could pick a quart from a few bushes. He procured plants and set them near his Belle de Fontenays, and they proved identical. As cultivated in that garden, it is as good a raspberry as one could desire. There were quantities of large fruit of fine quality, and the plants were hardy, but it is not the true Hornet. It makes many small suckers, which should be grubbed up.

The Chairman thought raspberry culture profitable for those who live near a market, because the fruit cannot be carried far. There is not generally a sufficient supply in the market.

Mr. Manning said that the fault of the Pride of the Hudson is that in a dry soil it sheds its leaves before the fruit is perfected. Mr. Roe, who sent it out, says that it will not succeed in the south or on dry soils. The quality of the fruit is good.

The Chairman had tried it on moist soils, and did not think it, or any variety which will not endure the sun, worthy of a place anywhere.

Mr. Philbrick said he preferred raspberries to strawberries, because he did not have to get down on his knees to pick and weed them, but he had not found them so profitable as strawberries. He had discarded the Clarke as uncertain, and was trying the Herstine.

Mr. Hadwen had grown raspberries for market and found them very profitable, but they must be well grown. When a plantation becomes old it is not profitable, and the grower neglects it. As with all other fruits, those who cultivate them well say they are profitable; and those who do not, say they are not profitable.

Mr. Hovey spoke of a fruit farm which he visited in England, where he saw a field of twenty acres of strawberries and another of raspberries of equal extent. There were, in fact, hundreds of acres in all, devoted to their culture. The raspberries were planted in rows, three feet apart, with five canes in a hill, and there were avenues through the field about one hundred feet apart. The canes were strong, and not a stake or a sucker was to be seen. Though the strawberries were not covered, they were not thrown out by the frost. The soil was a strong yellow loam, which would retain manure. This was in Kent, a county famous for raspberries and strawberries.

Aaron D. Capen had come to the conclusion that raspberries can be cultivated profitably, but as with all other fruits it depends on how it is done. Those who plant them in an orchard where the ground is in good tilth, as the Messrs. Clapp do with their currants, will be successful. At a late meeting of the New Jersey Horticultural Society, which the speaker attended, it was stated that strawberry growers used to think fifty bushels an acre a good crop, but one person in the southern part of the State said he had grown four hundred and twelve bushels per acre. The speaker thought he had succeeded pretty well when he got five thousand boxes per acre. A friend in Connecticut told him—and he believed the statement—that he had picked four boxes without moving. Some

have said that it would not do to manure too highly, because they run to vines; but the speaker thought they could not be manured too highly; the whole secret of success is in high tilth and generous manuring.

E. W. Wood said the question had been raised, how many strawberries could be grown on an acre, under favorable circumstances. He proceeded to state his experience, which, he said, might not be a fair test for all. He prepared a small piece of ground, which had been in grass and had produced three tons to the acre, by putting on a heavy coat of manure and trenching two feet deep. The plot was sixty-six feet long by sixteen feet wide, and was well drained. It was planted with Cutter's Seedling, Hovey's Seedling, and Boston Pine. The vines covered the ground, and he took from the plot over three hundred heaping boxes, which was at the rate of 12,000 boxes or 375 bushels to the acre. Under the same circumstances, but with other varieties, more could be grown. Mr. Wood spoke a good word for Cutter's Seedling, as one of the best varieties for family use. His plants stood from twelve to fifteen inches in height, and were so vigorous as to root in grass borders.

Mr. Wood mentioned the small fruit garden of William Doran and son, at Brookline, which was visited by the Garden Committee. The land was bought twenty-five years ago for twenty-five dollars an acre. The soil was a hard clay, with many stones, which were taken out with great labor, and the land was thoroughly drained. Though the owner is not particularly skilful or careful, this garden of less than two acres has, for the last ten years, produced from $1,200 to $1,600 in small fruits. Many farms of from one hundred to two hundred acres would not bring so much with much greater labor. The raspberries had not been replanted for fifteen years.

Mr. Manning said that he named and introduced the Cutter's Seedling. It was originated by the late B. F. Cutter, of Pelham, N. H. The speaker had picked three boxes of this variety without moving. The beds last longer without replanting than most varieties. In a soil trenched two feet deep it made runners eight feet long, and has produced seven thousand boxes of hulled strawberries per acre. In 1859 he brought fruit to the exhibitions of this Society for five successive Saturdays. He thought it the best strawberry for home use and near markets, but rather soft for distant markets.

Mr. Hadwen confirmed what had been said of the Cutter's Seedling. It is very productive, and is called for by his family and by all his neighbors who have tested it. The Newton Stock Club, when they visited his place, said they had never eaten better strawberries. He has grown strawberries since 1837, and tested many varieties, and Cutter's Seedling is the one that stands by. They must be picked at just the right stage, which is before they get dead ripe. It is valuable for the table and for near markets.

Mr. Manning said that at Andover no strawberry took so well as Cutter's Seedling. He thought there was not so much choice as some believed, between what we have now and what we had twenty years ago. The Early Virginia and Jenny Lind are small because there are so many berries. He had seen Boston Pines so large that two layers could not be got into a quart box.

The Chairman hoped the impression would not go out that we have made no progress in small fruit culture in twenty years. The Cutter's Seedling will not compare with the Charles Downing in value for general cultivation. There is also much improvement in raspberries. He hoped a great deal from the Cuthbert, and also from the Brandywine.

The Chairman announced a paper by Josiah W. Talbot on Peat and Peat Land and their Management, for the next Saturday, and that later, Joseph Tailby would open a discussion on the Propagation and Management of Hardy Roses.

BUSINESS MEETING.

Saturday, February 21, 1880.

An adjourned meeting of the Society was holden at 11 o'clock, Vice-President John B. Moore in the chair.

William E. Endicott, Chairman of the Library Committee, read the following report on the subject referred to that Committee at the last meeting of the Society :—

The Committee on the Library, which, by vote of the Society on February 7th, was directed to report in what way the Library Room could be improved as a place for meetings and for library purposes, have given the subject a careful consideration.

The piece of furniture which now occupies the centre of the floor, and which was placed there without the vote of the Committee, is said to obstruct both sight and hearing when discussions are going on, and also to prevent the room from furnishing seats to as many as a room of this size ought to accommodate. These objections seem to overbalance the advantage gained in the storage of books by the substitution of the present piece of furniture for the table formerly in use, for the Society can in no way benefit its members and extend its influence more than by the discussions, which are now carried on under difficult circumstances.

The Committee therefore recommend, First, That the central table be restored to its former height and condition, except as regards the compartments provided for pamphlets, so that in time of discussions it can be removed to the adjoining room. Second, That to provide for the books thus displaced, and also many more which are now almost inaccessible, two bookcases, corresponding in appearance with those now here, be placed on the west side of the room.

In making the latter recommendation the Committee wish it to be clearly understood that if it be carried out the relief it will afford will be only temporary. The new cases would be nearly filled at once if all the books now thrust out of sight, or contained in the central cabinet, should be put into them, and there are yet nearly $14,000 to be derived from the Stickney Fund before it passes from our hands.

Our Library is unequalled in America in its particular line, and ought to take a high position among the special libraries of the land. As its excellence becomes more widely known, its advantages for purposes of study and consultation of authorities will be more highly appreciated, and, as this Committee has once before remarked, it will be greatly to the profit and credit of the Society if it shall be found in such a condition that its treasures can be put to the use for which all books are designed. That can never be the case as long as some volumes are in this room, some in a janitor's room, and some in a little closet up stairs. Granting that the books thus referred to are wanted not more than once a year, for that once they may be almost indispensable. Moreover it is eminently true of books that, to a person not remarkably well informed, out of sight is out of mind. If the books are where they can be *seen* the volume consulted once a year may be of service

once a month, and thus be increased in value twelve-fold. The Library, therefore, should be all in one room, and measures must soon be taken to that effect.

The Committee deem it their duty to again warn the Society that our books are not safe. The new locks have improved the condition of things somewhat; but when we consider the value of some books in the room frequently let with the hall, for the convenience of the small army of hangers-on accompanying every show, it is plain that we run a great risk of loss by theft or damage.

We hope, therefore that the request made in our last Annual Report, for authority to obtain professional advice in regard to library accommodations, may soon be voted on, and that the inquiry may be made to include other methods of meeting the wants of persons to whom the halls may be let.

For the Committee,

W. E. ENDICOTT, *Chairman.*

On motion of John C. Hovey, the report was accepted and referred to a special Committee, consisting of William E. Endicott, Charles O. Whitmore, and John B. Moore.

Adjourned to Saturday, March 6.

MEETING FOR DISCUSSION.

On the adjournment of the business meeting, a meeting for discussion was held, William C. Strong, Chairman of the Committee on Publication and Discussion, presiding. It was opened by the reading of the following paper by the author, Josiah W. Talbot, of Norwood:

Peat and Peat Land.

Man, in his ruder state, subsisted entirely upon the spontaneous productions of the earth. His progress in civilization has probably kept pace with his progress in agriculture. When passing from nomadic life to the rude cultivation of the soil, he must soon have made improvements, and learned the use of manures. As population increased, and cities were built, these became more essential, and the same necessity has continued until now. But there is still room for improvement. The former wasteful and improvident

methods of farming here in New England and at the South, have resulted in many a worn-out and deserted farm and plantation. But we rejoice that improved methods of agriculture have recently demonstrated that there is still a value in these deserted lands. The old homesteads, around which cluster so many delightful associations, are as pleasant, and the lands are as remunerative to the owners of today as they were to our grandsires.

Many of the renovated farms are now producing better crops of grass and grain than the new lands of the West. The area of woodland in this State, which, for the last half-century, has been on the increase, is now diminishing; and, although the State may not produce one-tenth of what it might, still, I think there is progress. But I wish to call attention to the general neglect of our peat lands. In these are accumulated the almost useless and almost unknown vegetable deposits of unnumbered ages.

Professor Hitchcock, in his Geological Report estimates the peat lands in this State at 80,000 acres. Add to this the swamps and meadows, and what an amount of almost worthless land we have in our midst. A large part of this lies on streams and water-courses, which might be utilized for irrigation, and these lands might thus become intervals, the fertility of which would be unequalled in New England. But we must bear in mind that, even in intervals, where nature is most liberal, the land is not inexhaustible. Nature, when left to herself, seldom allows her lands to be impoverished; she annually returns more to the soil than she takes from it. But man takes all he can use, and sometimes neglects to make any return, and hence, our lands are impoverished. This will increase until we learn to compensate the soil for all that we take above the natural yield. If the farmer wants a bushel of corn more than his land will naturally produce, he knows that the application of a bushel of ashes will give it to him and his land will not be impoverished. The same is true of manure, and if the supply of this were inexhaustible, we could force our lands to yield abundant crops, without fear of exhausting them. Lacking this, we are compelled to ransack the animal, vegetable, and even the mineral kingdom for plant food. But in the light which chemistry has given us by analyzing plants and defining the elements of which they are composed, and the soils also—showing what they contain and what they lack in order to produce any desired crop—we need no longer work in the dark, as heretofore, but can understandingly draw from

all sources whatever we need. And in no department of agriculture is chemistry more useful than in its application to peat and peat land. These are composed principally of decaying and inert vegetable matter which chemistry teaches us to convert into the most desirable plant food.

While the estimates of the value of peat vary from a positive nuisance to the best of manure, it appears to me that a correct understanding of the nature and use of peat, would greatly modify these estimates, and enable many to act more consistently. Samuel W. Johnson, Professor of Analytical and Agricultural Chemistry in Yale College, in his little book, entitled "Peat and its Uses," has collected from the best authorities the most valuable information that has ever been published on the subject. "Peat," he says, "is the organic matter or vegetable soil of bogs, swamps, beaver meadows, and salt marshes, resulting from the decay of plants, as mosses, sedges, coarse grasses, and a great variety of shrubs, mixed with more or less mineral substances, derived from these plants, or, in many cases, washed or blown in from the surrounding lands."

But, in order better to understand the nature of peat, we need to bear in mind that, unlike the vegetable mould formed on the upland, it is grown, and its decomposition takes place *under water*. When vegetables on the land die, the oxygen of the atmosphere combines with the carbon of the vegetables, forming carbonic acid gas, which passes off in the atmosphere, while the remainder of the decomposed matter passes into the soil as vegetable mould, or humus. But the mosses and vegetables which grow under water to form peat, come in contact only with the small quantity of air found in the water, and decompose, or rather carbonize, very slowly. The carbon instead of being carried off in the air, as in the other case, remains in the stalks and roots of the plants in the form in which they grew, with all that would otherwise form humus; so that peat is humus carbonized and oxidized, and contains more nitrogen than the plants which formed it; and these qualities increase with age, so that old peat is better for fuel, or for a fertilizer, than new or later formed peat, but more difficult to decompose. It is a chemical compound, which chemistry teaches us how to reduce to its elements, in which form alone plants can use it as nourishment. Chemists agree that one hundred parts of good peat are composed of about fifty parts of carbon, forty parts of oxygen,

eight parts of hydrogen, and two parts of nitrogen, with a small quantity of mineral or earthy matter, all of which enter into the composition of plants. In the moss peats, these elements are retained in the form in which the mosses grew, almost as perfectly as in decayed wood, and when first taken from the bog it is little better fitted for plant food, than rotten wood. Both, to be available to plants, must not only be disintegrated, but thoroughly decomposed by unlocking the chemical compounds in which the elements are combined. When just from the water in which it has probably lain for thousands of years, if broken up, it will *slowly* decompose, just like dead vegetables, the oxygen of the atmosphere combining with the carbon and forming carbonic acid; the nitrogen in the peat uniting with hydrogen and oxygen and forming ammonia which passes off with the carbonic acid, while the remainder is humus. Thus, in time, the whole of peat is reduced to plant food. But this process of years may be reduced to days, or weeks at longest. Bring this green peat in contact with lime, potash, or some other alkali, or with green manure, or even with green vegetables, and as soon as heat is generated, decomposition commences. Let these be properly composted, and the carbonic acid and ammonia which would otherwise escape will be retained in a heap of highly concentrated plant food.

In addition to this, the acid in the peat, which frightens so many, and which is generally sulphate of iron, in the form of copperas, will be absorbed by the lime, forming plaster of Paris, another good fertilizer; or if it is in great excess, will form an insoluble salt, which is perfectly harmless in the soil; or which, meeting with other chemicals in the soil, may become useful in turn. Thus, we find nothing in good peat which may not be easily converted into good plant food.

But the strongest objections to peat have arisen from the improper use of it. Take the best of peat right from the water where it grew, and put it in its organized form into wet land, where it will have free access to water, and it will probably remain peat the next thousand years—as useless to vegetation as so much stone. Or put it upon any land before it is decomposed and it will remain useless a long time. Or put it upon land which has already more vegetable matter than animal manure or alkali to utilize it, and it would be an injury. Such land might, with some propriety, be said to be mucked to death. But, on the other hand, there is much

sandy land, nearly exhausted of humus, or vegetable matter, that would be benefited by good peat in almost any form. It certainly would make it retain the moisture better and prevent it from leaching so badly, and if there is potash or alkali enough in the soil, or if animal manure is applied, it will be improved by it and become fertile. But if the peat were decomposed before putting it upon the land, it would be better still, producing the same mechanical effect, and benefiting the crop at once. Even clay lands are essentially benefited by being mixed with decomposed peat.

But what do chemists say of peat as a fertilizer? How does it compare with other fertilizers? Take cow manure as a standard, and how will it compare? The latter is well known, for it has been most thoroughly analyzed by the best chemists and they all agree in the results. Now these same chemists have as carefully analyzed peat, and assure us that if they add a little potash, phosphate, and sometimes a little nitrogen, when thoroughly decomposed it cannot be chemically distinguished from decomposed cow manure, and the effect on vegetation is precisely the same. Now, if this is true, and it certainly is substantiated by the practice of many farmers, who have been using it in this way for years, and who assert that they could not carry on their farms were it not for their peat, may it not be possible that we have been paying out great sums for fertilizers when we could have prepared them ourselves, equally good, with very little expense?

But, thus far I have spoken of peat to be used on the upland, rather than of peat land. Can our peat lands be made valuable? In many places, they are already the most productive lands we have, and their fertility can be continued with much less expense than that of the upland. One reason for this is found in the fact that there can never be any lack of vegetable matter. When the surface is exhausted, we have only to plough deeper and bring up a new supply. All that is needed on such land is the chemicals, which, with the atmosphere, the sun, and the rain, will decompose this inert vegetable matter, and convert it into plant food. It is possible that more silex may sometimes be needed, but there is nothing cheaper than sand or gravel. A very small part of the cost of fertilizers for the upland will supply this.

But how are these worthless bogs to be changed into such fertile lands? The first thing is to manage the water. We are to remember that peat was formed under water, and it will be nothing but

peat so long as it remains there, and, as such, is worth no more for agricultural purposes than so much rock. It is plain, then, that it must be properly drained. I say, *properly*, drained; there are two extremes in draining. Land may be too dry as well as too wet; and this is especially true of peat land. But there is a peculiarity in peat lands which I have never seen noticed, and which, I think, has an important bearing upon their drainage. In most soils, the water channels run horizontally at different distances from the surface. In peat swamps the circulation is principally at the bottom. I come to this conclusion from the manner of their formation. When the stream, in the valley where the peat now is, was first obstructed by logs, or by the beavers, and a pond was formed, the moss, and other vegetables, came up around it, and slowly extended over the surface, until it became a meadow, or swamp, with the water flowing freely underneath. These mosses and plants having gained a foothold on the water, have continued their growth for thousands of years, gradually filling up the valley with their peat deposits. In many instances, these deposits rise and fall with the stream, and in some instances, in ponds, float about. The rains which fall upon them settle in the loose mass to the water beneath. This would keep open the water channels from top to bottom, and not horizontally. In addition to this, the mosses which form the peat have a continuous growth for centuries. Death follows up from the bottom. Instead of breaking up as most plants do, by decomposition in the atmosphere, these never come to the atmosphere, but slowly decompose, or, rather, carbonize, in the place and the form in which they grew. The stems, dying much like the old heart wood of trees and running from the bottom to the top, form a complete set of capillary tubes, through which the water circulates like the sap in the pores of wood. These tubes are full of water as long as there is water at the bottom; hence we find peat, which has not been removed from its bed, always full of water. Now the question arises whether it is desirable to drain this to the bottom by cutting off the springs that feed it. All vegetables want water, and some roots will go down twenty feet to find it, but they would never go to that depth if they found water sooner. Grass and corn roots will go down five or six feet for moisture, but they would not if they found water enough above. They do not find humus there. They can find very little carbonic acid there, for there is neither carbon nor oxygen there to

decompose it. What gain then arises from obliging the roots of trees and plants to go down so deep for water when we can just as well give it to them nearer the surface and in close proximity to the soil which we cultivate and manure? In peat land this can be easily managed.

But if peat land is so rich in plant food, why are peat bogs so barren? For the same reason that rotten wood will not sustain vegetation. Peat, like rotten wood, is an organized mass, and is worthless until it is disorganized and decomposed. It is a compound chemically locked up, and unless brought in contact with something that has a stronger affinity for one of its elements than they have for each other it will remain peat forever, affording no nourishment for plants. But why is the mould taken out of a hollow tree such good plant food? Because it is thoroughly decomposed and readily yields the elements plants desire. So of peat; break up the organization, thoroughly decompose it, and there is no better plant food. Now apply this to peat land. While the water passes up so freely through this organized, capillary mass of peat, the peat remains in its own element; but break up this organization with a plough, cut off these capillary tubes as far down as you wish to cultivate—that is as deep as you wish your plant roots to grow—stir it up thoroughly, put in potash or some alkali or animal manure if you have it, and set this mass to fermenting—let the air into this mass of carbon and fill your ground with carbonic acid—put in something that will change the two per cent. of nitrogen found there to ammonia, and it will be in the soil just where you want it; and leave the organized peat below for a subsoil to draw up the water for your plants, so that they will not be obliged to spend half the growing season going down six feet for water—do this thoroughly and your peat lands will be the pride of your farms. Of course the surface water must be removed and kept down just so that your land will never suffer from drought. I am told that such land is the last to suffer from this cause.

When peat lands are on streams where the water can be used for irrigation what intervals they may be made. Take for illustration the 4,000 acres of peat land on the Neponset river, in our immediate vicinity. This large tract is now rendered almost worthless by the dam of a single paper mill which might be more efficiently driven by a twenty horse-power engine. The never-failing stream which passes through the meadow could be made to

irrigate the whole in the spring, and by the roads already built across the meadows at different intervals, with proper gates at the bridges, the water could be made to fill the ditches or flush over the land on one section after another, even in the dryest season, so as to completely protect it from drought, and this beautiful interval would become the garden of the metropolis.

If the value of these lands is doubted, go out to the Blue Hill farm, in Canton, owned by Mr. Wolcott, and he will show you an acre and an eighth in the higher part of this meadow, on which he cut six tons of good hay the present season, with less manure than would suffice for half an acre of upland. Or go in the autumn, and on land where, four years ago, they were obliged to pole off a light crop of coarse hay and bushes, he will show you a crop of celery which will do your eyes good to look upon. Or go to a section of the meadow near the stone factory and examine a piece, where, for the last forty years, the owner has annually taken three crops of grass for his cows, and the land is still as good as new. Or go to Norwood, and on a piece of meadow eighty rods from the shore, and cultivated only two years, witness Hungarian grass, breast-high, and other crops equally promising, and you will come to the conclusion that there is no discount on peat land, where you can control the water.

Now, in view of these facts, and of such results, I would ask if it is good husbandry to allow 80,000 acres of peat land in Massachusetts to remain almost wholly unproductive?

Discussion.

The Chairman remarked that the subject of the paper is of great interest, and he wondered that it has not excited more attention.

John B. Moore said that he had had some experience with peat lands. He has plenty of such land of his own. Supposing there are 80,000 acres in the State, as Mr. Talbot had said, he did not believe it is all capable of improvement. In lands composed of spongy peat, and having the water within a foot of the surface, and where a fall of only two feet more can be obtained, if you reduce the water two feet, the peat comes down like a sponge, being compressed by its own weight. He said this, not to discourage improvers, but to warn them to be sure, before beginning, that they have fall enough. Solid peat, such as is used for burning, does not settle so much. If it is desired to grow grass on

peat lands, enough sand must be put on to furnish silica, if it has not got sand from the upland. But the richest peat soils cannot continue to produce crops forever without manure.

Mr. Moore spoke of a gentleman who bought twelve acres of land and divided it into twelve lots, by posts painted and numbered, to experiment with fertilizers on different crops. He first gave the land a dressing of from one hundred to one hundred and fifty loads per acre of peat, which was unfortunately impregnated with some deleterious ingredient—perhaps sulphate of iron—and, though it was thirty years ago, the land has not got over the injurious effect of it yet. Perhaps the deleterious quality might have been corrected by lime. The speaker had no doubt that good peat is beneficial to sandy land, as it retains moisture and furnishes decomposed vegetable food to plants. It is also good for pretty heavy soils, which it lightens. He studied Dr. Dana's "Muck Manual" many years ago, and believed his analysis of peat, from which it would appear that by the addition of a few ingredients it can be made equal to cow dung, but the crops did not believe it, and he had to give up. Yet the analysis is no doubt correct. Professor Goessmann will tell you there is much potash in certain rocks, which the chemist can obtain by dissolving them, but plants cannot. Chemical analysis will show what is in the soil, but it will not show what the plants can get. No chemist, with all his knowledge, has ever succeeded in compounding a fertilizer equal to stable manure. The same substances in a chemical manure do not produce the same effect. He would not underrate chemists, but Professor Goessmann would say precisely the same thing. There is something in nature beyond the chemist—something that we cannot account for. Professor Goessmann says he cannot tell what a farmer has got in his soil so well as the farmer himself. As an absorbent of the fertilizing liquids of the farm-yard, dry peat is more effectual than dry clay, which again will absorb more than sand. It furnishes both food and moisture to plants. It may be desirable to improve an unsightly bog near the house, even if it does not pay as a farming operation. But before undertaking any such work for profit, be sure there is sufficient fall for drainage, especially if the peat is deep. Mr. Moore had seen a meadow twenty-five feet deep.

Mr. Talbot said that when he advised the application of peat to land, he qualified the recommendation by saying "good peat."

That of which Mr. Moore spoke as producing such lasting injury to the land, was not good. The speaker said that good peat would be beneficial in any form, but it would do much more good if decomposed than if not. There is difference in decomposed peat, and he believed that some, with chemicals added, is equal to cow manure. He did not see what difference it made whether plant-food came through the animal, vegetable, or mineral kingdom.

Benjamin P. Ware said that he would add something, not in the way of theory, but of practice. He had had a great deal of experience in preparing manurial substances from peat. When freshly dug, peat contains a great deal of matter which is not in proper condition for plant food; it is inert and must be changed. He had observed wonderful results from composting. He digs peat in August and allows it to drain and afterwards to be mellowed by freezing. Then he mixes equal quantities of peat and sea manure, such as kelp and other sea plants, which produce a very rapid fermentation, and the whole becomes equal to horse or cow manure, cord for cord. Horse dung is equally as good as sea manure to produce fermentation. He had seen very beneficial results from the application of such a compost.

In regard to the value of reclaimed peat lands Mr. Ware thought there could be no question. He knew a pond of five acres, surrounded with peat land overgrown with blueberry bushes and cut into ditches where peat had been taken out for fuel—the whole making a nuisance and an eyesore. The outlet ran over a gravel bank, which was cut through so as to lower the water three feet, and the swamp settled eighteen inches. The bushes and hassocks were cut up and thrown into the pond, making more land. In winter gravel was hauled on, and in the spring potatoes were planted. The ground was afterwards laid down to grass, and with top-dressings at intervals of three years it produced for nine years two crops a year of five tons in all. It then began to fail and was broken up, and with the same top-dressings has been good nine years more.

Mr. Ware knew a flat meadow of two acres which was so soft, even after being drained, that it could only be ploughed by keeping the team on the upland and carrying the plough back by hand after ploughing a furrow. The first crop was mangels, which more than paid for all the expense of reclaiming, and last year it produced more than four tons of grass per acre. The level of the water was

reduced three feet by draining, and water brought in at the inlet was carried away by a box-drain entirely under ground, and now it is the most productive land on the farm. He could mention other instances, but these two prove that where peat lands can be drained they are the most valuable part of the farm for grass crops. Peat is not manure in itself any more than raw hide is leather, but by proper treatment it becomes manure.

In answer to an inquiry Mr. Ware said that he did not think the grass from these meadows is as good as that produced in smaller crops on warm upland, ton for ton. It is coarse, but it is as good as any grass where such large crops are produced, and it will sell for as much as any, especially in Boston, where coarse hay is preferred.

Leander Wetherell thought Mr. Ware was incorrect with regard to Boston market. Buyers there have found out that hay grown on the Sudbury meadows is not so nutritious as that from dryer soils. He thought that all hay above a ton and a half per acre is got at the expense of quality. Neither of the gentlemen who had preceded him had given a definition of peat which would enable him to go out and select a peat meadow, if he wished to purchase one. Good peat, when dug out, will become as mellow as old manure. He had dug decomposed peat in August and let it remain till May, when he put it on an old cultivated sandy soil, and there was very little difference between the crop of corn thus produced and that grown alongside with good manure. He knew a bog where the mud was shallow, which was drained to the bottom and planted with potatoes, and though the crop was not large it was very early, and paid all expenses of draining. In Hadley is a swamp which sold for five dollars per acre; the owner drained it by cutting through a gravel bank twelve feet deep, and planted with broom corn and tobacco, and it brought better crops and more rent than the best tobacco lands on the Connecticut river. On the other hand there is in Sherburne, Franklin County, a large swamp, thoroughly drained and gravelled, which has never produced any return and is now abandoned. The trouble is undoubtedly the settling of the swamp from the weight of gravel.

Mr. Moore said there was some confusion among the gentlemen who had spoken, as to what peat is. Mr. Wetherell had spoken of peat which became mellow, but fuel peat will dry as hard as a brick, and it is best to dig it in autumn and expose it to the frosts of

winter, which will tear it to pieces. He had dug out of the hollows between hills a material resembling leaf mould, which did not appear to have any acid, and he thought the peat with which Mr. Wetherell produced so good a crop of corn was probably a vegetable mould like this. Four cords of spongy peat will rot down to one, and between this and fuel peat there are all gradations. Near upland the deposit in swamps consists largely of sand which has been stained black. Pond mud is almost all black sand.

Mr. Wetherell said that in speaking of valuable peat he referred to that which is thoroughly decomposed. He knew a bog of a hundred acres with no sand, but mud which would adhere to your boots. There is much peat land in this neighborhood which is well adapted to growing celery.

The Chairman said there was a large tract in Newton which he had advocated taking possession of for a park.

Mr. Talbot asked attention to the question how deep it is desirable to drain land.

It was voted to continue the discussion of the subject on the next Saturday.

MEETING FOR DISCUSSION.

Saturday, February 28, 1880.

A meeting for discussion was holden at 11 o'clock, William C. Strong, Chairman of the Committee on Publication and Discussion, presiding. The subject assigned was "Peat and Peat Land," continued from the preceding Saturday, but before taking it up there was some discussion in regard to the "Tailby stock" for roses, and on other subjects. Flowers of the Tailby stock were shown by Mr. Tailby. In a discussion last year* this was pronounced the Madame Sontag rose, but the impression of Mr. Tailby was that it was different.

Charles M. Hovey thought the point was not of sufficient consequence to discuss. The stock has no distinguishing merit, and he did not think it very valuable. It is tender. It may be a seedling. Madame Sontag is reputed to be a fine rose.

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*Transactions for 1879, Part 1, page 89.

The Chairman remarked that there might be a difference of opinion as to the value of the stock, but whatever the value we like to settle the identity of varieties.

Mr. Hovey said that from 1842 to 1855 Mons. Vibert raised an immense number of roses, of which this might have been one.

The Chairman spoke of the peculiarities of the present season, and said that notwithstanding its mildness many of his roses had been killed.

John B. Moore suggested that many roses did not have the wood well ripened, and that such ones might have been killed early in the winter.

Mr. Hovey said that some contend that trees never freeze, and he thought that under certain conditions they never do. Starch does not freeze. At Verschaffelts' nursery, at Ghent, Nordmann's spruce was killed to the ground, and nearly all conifers suffered by the severity of the winter, and rhododendrons were killed by the thousand. By the 6th of December the thermometer was from one to eleven degrees below zero. It was the same in England. It is not the degree of cold, but the condition of the tree, which causes injury. When the sap has been changed to sugar, gum, or starch, the cells are not distended by freezing, and plants are not injured. Some camellias which he left out-doors were not injured until the mercury fell to 8°, and were not killed until it fell to 4° below zero, and then the roots survived, but they had snow over them. He had never known any thoroughly hardy trees killed, but some years ago he had trees injured by being whipped about and broken. He agreed with Mr. Moore that the roses were injured about the 18th of November. The shoots were blackened at that time.

J. W. Talbot said that after a season, when he was a boy, when all trees were in vigorous growth in October, the Baldwin apple trees were nearly all killed. Any one who has chopped timber in winter knows that trees will freeze.

The Chairman said that he had accounts from Orleans, France, of great injury to trees there.

Mr. Moore confirmed what the Chairman had said of injury to trees in Europe, and what Mr. Talbot had said of the freezing of trees. Pine wood becomes so brittle that it will fly to pieces if you try to split it when frozen.

The Chairman said that you can see the frost in the wood.

E. W. Wood remarked that the wood of his Hybrid Perpetual roses looked well.

James Comley said that roses grown in pots in the summer, and put in a barn cellar early in autumn, had produced good crops of flowers, but those left out later had not done so well. Those not frozen have done as well as ever, but those frozen have not borne half a crop. To be successful year after year, they should not be frozen. The half-hardy rhododendrons, which are commonly left out as late as possible, had the buds frozen last year before they were housed for the winter. Anthony Waterer said that in forty years he had never seen such destruction among half-hardy rhododendrons as this winter. The speaker was satisfied that frost does freeze sap.

The Abel Carrière rose, which was exhibited by him, forces very freely and comes very large. It is as good for forcing as the Gen. Jacqueminot. He recognized the flower of the Tailby stock, but did not recall the name of the variety. He was acquainted with the Madame Sontag rose, and the flower is three times as large as that of Tailby's stock.

John Robinson quoted from the "California Horticulturist," a statement in regard to B. B. Redding's orange orchard, that when the trees were watered late, ten per cent. were injured by the winter, but when watering was discontinued earlier in the season, the injury was very much less.

Benjamin G. Smith, said that his rhododendrons, andromedas, and kalmias, never looked better. He mulches them very heavily with forest leaves. His Hybrid Perpetual roses were also looking well.

The Chairman thought that most stocks would come out in the spring uninjured. He had a row of plum stocks in low land, which grew very rank, and were much killed.

The subject assigned for discussion was here taken up, and the Chairman called on Edmund Hersey, who said that it covered a wide field, and to talk intelligently upon it might require a definition of terms. If we look up authorities, we shall find that the term "peat," includes matter in all stages of decomposition, but he should confine himself to the common acceptation. Peat meadows were once ponds, round the margin of which moss grew. Many of these ponds are now so deep that the moss has not yet grounded. The coarser grasses spring up on this decaying moss, and, these also decaying, both together form what is often called

vegetable mould, but what authorities call peat. Few plants penetrate to the bottom of the peat, but the skunk cabbage does, except where it is very deep. The speaker had seen the stumps of pine trees four or five feet in diameter, cut a hundred years ago, which grew on a little mound of soil in a meadow that is still afloat in places. Such meadows have "breathing holes," where you can sound to the depth of twenty feet, or more. He exhibited a specimen of peat which had grown within forty-five years in the manner described, and would, eventually, form solid peat.

What shall we do with these peat lands? There are hardly two meadows alike, and every farmer must study his own meadow. Some meadows have been partially drained in order to dig peat for fuel, but coal was introduced, and the peat was not dug. Meadows settle as the peat decomposes. The speaker thought that most meadows would settle down one half the depth above the drainage. Meadows already partially decomposed are more valuable than raw peat meadows. The first thing to consider, when it is desired to reclaim a meadow, is whether it can be drained sufficiently. If it can be drained, the owner would be justified, after the top has settled, in putting it into English grasses. There are thousands of acres of meadow in Massachusetts which can be drained, and other thousands which cannot be. The latter the speaker considered most valuable. They should be planted with cranberries. He had had experience, on a small scale, with this crop, during the last twenty-seven years, and believed it to be, after Indian corn, one of the surest of crops. Even on land not naturally adapted to it, it is more profitable than the apple crop, giving the farmer ready money without much expenditure for manure or labor. The work of preparing the meadow can be done largely in winter, and more money can be made on it than on grass. He would not advise to plant all cranberries, but he would encourage any one who has a meadow where he can command the water, to try; but he must go to work the right way, and must select the best and most productive varieties.

Dr. E. L. Sturtevant said he had carefully observed the growth of the cranberry, and thought the soil had less to do with its productiveness than is generally supposed. In a cut ten or fifteen feet deep, on the Milford Railroad, he had seen cranberries growing in gravel and bearing fruit while they were destroyed by drought in a meadow near by. In reclaiming a peat meadow it is important

to consolidate the soil, either by gravel, maul, or wheels. He had noticed that the most productive portion of the meadow was often in cart tracks. It is important not to draw the water too low, for in dry seasons peat meadows suffer more than any other soil. He never knew peat to become cultivable until it took on the character of loam. The presence of angle worms indicates that it is approaching the desired condition.

J. W. Talbot said that as long as peat remains in its original condition, it is useless. It never will decompose if covered up, and as long as the circulation continues up and down (as described in his paper last week) instead of horizontally, it will remain peat. There is a great difference between the results of decomposition in the air and in water; in the latter case peat carbonizes. There is more carbon in old than in new peat; a piece of old peat has laid on the top of a wall for twelve years without decomposing. Something is needed to break up this compound and bring it into the condition of vegetable mould or humus. Mr. Hersey had spoken of meadows that could not be drained, but the speaker advised those who might attempt to make a cranberry meadow, not to waste time on land that could not be flowed as much as was desired. In his own meadow he took off the water in April when he should have left it on until May; he had lost the crop four years out of seven by taking the water off too early. He thought the spring flowing the only one that does any good; it keeps the plants back.

John B. Moore said that he once thought of going into cranberry culture, but before doing so he went down on Cape Cod and looked into the subject thoroughly, travelling over the Cape on foot. The conditions for this crop are not right in one meadow out of two hundred. There are two insects which are very injurious to it; one eats the vines in June; the other gets into the fruit in August. Neither of them can be destroyed except by flooding. If the water stands on the vines in a warm day in summer the fruit rots, and therefore the water must be let on and drawn off very quickly. Away from the sea-coast, cranberries are liable to injury by frosts in autumn, from which they can be protected only by flooding, and the water must be drawn off the next day. Mr. Moore said that he came back from the Cape wiser than he went.

Mr. Hersey thought Mr. Moore was deceived by persons who were afraid of his competition. They threw a good deal of cold water on him. Cranberry culture is not so difficult as Mr. Moore's

remarks would imply. The speaker had grown good crops on strawberry land. He admitted that there are insect enemies to the cranberry on Cape Cod, but these are not found everywhere. The "fire worm,"* which injures the vines, is not found in Hingham, and the "curculio" or "cranberry weevil"† need give no trouble if the land can be flowed two feet deep in winter. The cranberry will stand more drought than any other plant he knows, but there is one place where it cannot be grown, and that is where it is wet all the time. They must have three months of dry weather. His little experiment in cranberry culture was on land that could not be flowed, and there the crop was more certain than Indian corn. He had taken out peat and put in three feet of clean sand, and in twenty-seven years had had only two failures of cranberries there.

Dr. Sturtevant said that on a gravel bottom he got cranberries four years out of six; the other two years they perished with drought.

John Robinson said that the best crop of cranberries he ever saw was in a depression between the dunes in the sand on Plum Island. They were among moss, which kept the ground moist.

E. H. Hitchings said that the best cranberries he had ever seen were by the side of the New York and New England Railroad, in Dedham, where the peat had been dug out and gravel was left.

J. W. Manning had seen them flourishing in a very deep cut on the Boston and Maine Railroad. David Perham, of Chelmsford, took four bushels from a square rod in a wet, mossy meadow, which was capable of being plowed, and in some spots was very favorable to their growth.

Mr. Talbot spoke of a favorable report which he had heard of their success for some years on upland in Peabody, but the ultimate failure of the experiment showed that something was wanting. Cranberry growers do not want the roots to strike peat.

Charles M. Hovey asked whether cranberries will grow on upland generally. In Sandwich, Mass., in preparing for them, the peat is invariably covered with sand from an inch to an inch and a half in depth; but if it is covered three inches deep, there will be but few cranberries.

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* *Anchylopera vacciniana.* See Packard's Guide to the Study of Insects, page 338.

† *Anthonomus suturalis.* Packard, page 487.

Dr. Sturtevant said that the cranberry is not necessarily a peat plant, but a peat plant through circumstances. It grows in peat meadows, perhaps, because the snow and water lie there. He had seen it fruiting heavily in pure sand, but it will not grow in pure peat. It must have winter protection, and he had placed boards around them in his garden to keep the snow on. He had grown it in the greenhouse.

Mr. Talbot said that the analysis of peat ashes shows a small quantity of mineral matter, which chemists say is of but little value. Ira Gill, of Walpole, took the peat ashes from his hat factory and applied them to a barren knoll and it became fertile. He attributed the increase in fertility to the peat ashes.

Mrs. H. L. T. Wolcott said that she had been interested for two years in reclaiming peat lands. She had found no decided difference between peat and muck. Mr. Talbot had stated that muck decomposes, while peat will not. She exhibited a specimen taken from a ditch three feet deep, in contact with clean sand, and wished to know whether it was muck, or ever would be.

Mr. Talbot said that Professor Johnson had defined peat. There is a distinction between that formed from grasses and that formed from sphagnous mosses. Sometimes leaves work in. Peat is fibrous, the fibres running from bottom to top. The substance spoken of last week by Mr. Moore, as having been dug out of the hollows between hills, is not peat, but muck.

Aaron D. Capen said there is as much variety in what is called peat as in the soils of the United States. The grades vary from simple mud to the best muck or peat. The specimen taken by Mrs. Wolcott from over a substratum of sand is very different from that spoken of by Mr. Talbot in bogs which settle a foot when drained. In 1835 or 1836 the speaker reclaimed a meadow where the herd's grass grew up to his chin the first year, and up to the top of his head the next.

Benjamin P. Ware said that his experience did not show much value in peat ashes. In clearing up meadows he had gathered and burnt many hassocks, and spread the ashes on grass upland, but it did not increase the crop of grass.

E. P. Richardson's experience had been the same. Peat ashes were of little, if any, benefit to potatoes.

Mrs. C. N. S. Horner said that in the northern part of Essex county, the distinction made between peat and muck or mud, is

that the peat will burn, while the muck or mud will not. She knew an instance where peat ashes were spread on land forty years ago, and whenever potatoes have been planted there since, they have been so rough as to greatly lessen their value.

Mr. Talbot said that old peat contains fifty per cent. of carbon, and will burn, but if thoroughly decomposed it will not burn; the carbon is then gone and the humus is left. He thought Mrs. Horner's distinction a good one. Peat leaves a very small quantity of ash, and muck seventy-five per cent. of ash.

Mr. Moore said that in Ireland the top of land is pared off and burnt that the ashes may fertilize the soil, and the top of bogs is burnt here.

Mr. Talbot said that on the top of peat meadows, the hassocks are often from seven to twelve inches deep, and this vegetable matter makes very valuable ashes, which gives the heaviest crops of herd's grass, but if the peat is thoroughly decomposed it will not burn. When peat meadows take fire, they do not always burn down to the level of the water.

Leander Wetherell understood the difference between peat and mud to be that the latter is more thoroughly decomposed, so as to be in the condition of paste. Dr. Dana says, that peat ashes abound in carbonate, sulphate, and, especially, phosphate of lime.

Mr. Talbot said that what others had stated in regard to the burning of peat meadows, did not conflict with his statements; only the fibre is burned.

Mrs. Horner said that in digging peat for fuel, the topping knife is as important as any tool. Sometimes only a few inches is removed before reaching the fuel peat, and sometimes as much as a foot. Does not Dana say that the bottom of the peat meadow is often an imperfect peat?

Mr. Moore said that he had cut hundreds of cords of peat, and the reason that the top is thrown aside is not that it will not burn, but that, as low as the frost has worked, it is so pulverized that it will not hold together.

Mr. Talbot said that in such cases the peat on top is only disintegrated and not decomposed. To decompose it requires chemical action.

The Chairman gave notice that on the next Saturday, Dr. E. L. Sturtevant would present some carefully collected instances of the Influence of the Stock on the Scion, and *vice versa*.

BUSINESS MEETING.

SATURDAY, March 6, 1880.

An adjourned meeting of the Society was holden at 11 o'clock, Vice President, John B. Moore, in the chair.

WILLIAM H. HUNT, of Concord,
was elected a life member of the Society.

The meeting was then dissolved.

MEETING FOR DISCUSSION.

At the close of the business meeting, a meeting for discussion was held, William C. Strong, Chairman of the Committee on Publication and Discussion, presiding.

The subject assigned was the "Influence of the Stock on the Scion and *vice versa*," and was opened by Dr. E. L. Sturtevant, who said that he should feel diffident in coming before the Society with a paper on the subject, but for the deep interest in the discussions a year ago, which appeared to be greater than had been felt in any other subject, and the widespread interest shown by the unusual number of calls for the TRANSACTIONS containing the report of those discussions.

Dr. Sturtevant said that it seems to be admitted by many of our best botanists and leading pomologists, that there is a reciprocal influence between the stock and the scion, but to what extent this influence is exerted, its boundaries, and the conditions under which it acts, does not, at present, appear to be well defined. The influence of bud variations, of cross fertilization, and of graft hybrids, is not in every case distinguished from the effect of the graft and stock upon each other, and hence a confusion. It, therefore, seems proper to bring together all the asserted cases where the stock has influenced the graft, and *vice versa*, in order that the evidence for making up our minds may be more fully under our observation.

Dr. Sturtevant expressed the opinion that it is in the power of the skilled gardeners and accurate observers, of whom there are so many among the members of this Society, to do much towards giving a scientific character to our TRANSACTIONS, by aggregating

their individual observations. If once the habit were established, of each one, as circumstances permitted, offering to the Committee on Publication, an account of each case of bud variation; of each case of influence of graft on stock; of each case of monstrosity, or of unusual variation, etc., in the course of the year the mass of material would be sufficient to form a publication valuable to science and honorable alike to the contributors and the Society.

Dr. Sturtevant then proceeded to read the following instances of the effect of the stock on the scion, and *vice versa*, which he had collected, with the assistance of the Secretary of the Society, beginning with those relating to the Influence of the Stock on the Scion:

Paul Dudley, F. R. S., who resided at Roxbury in 1726, spoke of a Bergamot pear tree, from which a scion was taken and grafted into a common hedge pear, but the fruit did not prove so good as the original, and the skin was thicker.—*Phil. Trans., abridged, Vol. VI, Part* 2, 341.

In 1850, A. C. Hubbard, writing from Michigan, said, "a neighbor of mine, who is a very close observer, took scions of the Esopus Spitzenberg apple and grafted over a tree which had previously been grafted to some other variety. The fruit from this tree far surpasses any other Spitzenbergs he raises, in flavor."—*Pat. Rept.* 1849–50, 282.

B. Hathaway, a nurseryman and fruit grower in Michigan, writes, "The result of my own observation and experience goes to show that the stock has an influence in determining every characteristic of the fruit. Although not always appreciable, it is often so strikingly manifest as to leave no room for doubt. . . . I have a Northern Spy on Greening, and this tree alway gives me my largest specimens for the fairs, though pale in color; while two trees close by, grafted on Esopus Spitzenberg, always give fruit highly colored, but never so large." He also states that he has ten root-grafted Northern Spy trees on which the fruit is always alike, and forty other Spy trees on large seedling stocks on which the fruit is constantly and markedly varied.—*Ag. of Mich.*, 1871, 139, 140.

Two instances are related by H. S. Tyler, of Dalton, Mich., of Baldwin grafts from the same tree following the characteristics of the trees on which they were grafted—one a seedling, small, sour, high-colored apple, keeping very late; the other sweet. The grafts

were so changed that their identity was doubtful, though they were finally decided to be Baldwins.—*Rural New Yorker*, *August* 16, 1879.

P. Barry thinks the sweet and sour apple might be produced by grafting the Greening on a sweet apple stock in the way recorded of the ordinary graft hybrids, and that the striped apple referred to in the same article might have been produced by grafting a red apple on a green apple stock.—*Gard. Month.*, 1869, 358.

My garden contains two peach trees of the same variety, the Acton Scott, one growing upon its native stock, and the other upon a plum stock,—the soil being similar, and the aspect the same. That growing upon the plum stock affords fruit of a larger size, and its color, where it is exposed to the sun, is much more red; but its pulp is more coarse, and its taste and flavor so inferior that I should be much disposed to deny the identity of the variety if I had not inserted the buds from which both sprang, with my own hand.—*Knight*, *Phys. and Hort. Papers*, 273.

We know that a few of our best native varieties of the pear, when grown upon the quince, are more perfect than upon their own roots.—*W. C. Lodge*, *Dept. Ag. Rept.*, 1865, 201.

A slight effect is sometimes produced by the stock on the quality of the fruit. A few sorts of pears are superior in flavor, but many are also inferior, when grafted on the quince, while they are more gritty on the thorn. The Green Gage, a plum of great delicacy of flavor, varies considerably upon different stocks; and apples raised on the crab, and pears on the mountain ash, are said to keep longer than when grown on their own roots.—*Downing*, *Fruits*, *ed.* 1872, 29.

I have lately seen some curious cases of a modification of the character of black grapes, alike in flavor, size, and color, by being grafted on the White Syrian and White Nice; notably that recent introduction, Mrs. Pince, had its bunches and berries both grown out of normal character, and its flavor spoilt by being so treated.—*Gard. Chron.*, 1871, 1100.

A committee of the Southern California Horticultural Society reported that the Navel orange budded on the citron, lime, and China lemon, in each case showed marked and distinct characteristics derived from the stocks.—*Southern Cal. Hort.*, *II*, 78.

Robert Thompson says: "It is well known that the stock will have an effect upon the variety worked upon it."—*Pomological Magazine* (*Pomologia Britannica*) *under Ribston Pippin*, *III*, 141.

The double scarlet thorn budded on the pear in 1866, grew with extreme vigor in 1867, and flowered abundantly in 1868, and bore fruit abundantly, which were not single seeded, but contained from two to four seeds. The haws had large, open eyes, and were of a flattened shape. The trees from which the buds were taken had flowered previously for several years, but had never produced a haw. After the fruit had ripened, both buds and stock died.

Grafts of the same on pear stocks pushed splendidly in 1868, and formed leaves eight inches across, bore haws in 1869, though less abundantly, but with seed similar to that of the budded plants, and then died.

Paul's Scarlet Thorn, grafted on pear, grew luxuriantly, and the individual flowers were very much larger than on thorn stock, but of less vivid color. The excessive vigor of growth of the thorn on pear seems to forbid its long endurance.

Grafted on the quince, the thorn made nice dwarf plants.—*Gard. Chron.*, 1870, 458.

Pears grafted on the hawthorn showed a resemblance to it in form and other points.

The editor of the "Gardener's Chronicle" adds: "We cannot shut our eyes to the increasing number of cases of alleged graft-hybridization. Very few of these cases have been submitted to the rigid scrutiny of competent observers; nevertheless the number of the alleged cases is now so considerable that the necessity for inquiry and direct experiment becomes urgent. So many interests are involved in this question that it must not be pooh-poohed because it runs counter to general experience and belief. Admitting, for the sake of argument, that some of the recorded cases are what they pretend to be, it must still be granted that they are quite exceptional, but this very circumstance renders further investigation all the more desirable. In our search after the why and wherefore of the exception we may perchance be able to light upon some of the 'reasons why' for the general rule—itself greatly standing in need of further elucidation."—*Gard. Chron.*, 1870, 6.

M. Carrière twice inserted grafts of the *Aria vestita* on thorn trees growing in pots; and the grafts, as they grew, produced shoots with bark, buds, leaves, petioles, petals, and flower stalks, all widely differing from those of the *Aria*. The grafted shoots were also much hardier, and flowered earlier.—*Revue Horticole*, 1866, 457.

Some years ago we grafted the Styrian or Keele Hall Beurre Pear on the Citron des Carmes, which is one of our earliest summer pears, and the result is that the Styrian, thus treated, is about three weeks earlier than the same kind on the ordinary pear stock, and better flavored.—*The Garden*, *IV*, 334.

A few years ago I cut off most of the limbs of my Jargonelle and Vicar of Winkfield and grafted both with Clapp's Favorite. They have commenced to bear, and those on the Jargonelle are two or three weeks earlier than those on the Vicar.—*Stephen Adams*, *in Germantown Telegraph*.

I have also a Talman's Sweet, a root-graft twenty years planted, that until recently has borne very sparingly, while grafts cut from it and set in top of other trees have borne well and early.—*B. Hathaway*, *Ag.*, *of Mich.*, 1871, 125.

Grafting a young twig on an older stock has the effect of making it flower earlier than it would otherwise do.—*Balfour's Bot.*, 284.

A scion taken from a young tree that has never fruited will be hastened in its growth when grafted on a mature tree, and bear sooner than it would if it had been left to itself.—*Horace Piper*, *Dept. Ag. Rept.*, 1867, 315.

While grafting never effects any alteration in the identity of the variety or species of fruit, still it is not to be denied that the stock does exert certain influences over the habits of the graft. The most important of these are dwarfing, inducing fruitfulness, and adapting the graft to the soil or climate.—*Downing*, *Fruits*, *ed.* 1872, 28.

John Watson, St. Albans, thinks the stock on which a Marie Louise pear is worked, causes it to set fruit remarkably well.—*Gard. Chron.*, 1869, 664.

The Double Yellow rose, which seldom opens its flowers, and will not grow at all in many situations, blossoms abundantly, and grows freely when grafted on the common China rose.—*Carpenter*, *Veg. Phys.*, 195.

Thoüin found that three species of *Robinia*, which seeded freely on their own roots, and which could be grafted with no great difficulty on another species, when thus grafted, were rendered barren. On the other hand, certain species of *Sorbus*, when grafted on other species, yielded twice as much fruit as when on their own roots.—*Darwin's Origin of Species*, 231.

Downing asserts that when a graft is taken from one of these trees [of North American varieties of the plum and peach which reproduce themselves truly by seed] and placed upon another stock, this grafted tree is found to lose its singular property of producing the same variety by seed, and becomes like all other worked trees—that is, its seedlings become highly variable.—*Fruits of America, 1st ed.*, 1845, 5. In the edition of 1872, page 4, this statement is questioned, and attention is called to the necessity of verifying it.

Cabanis (quoted by Sageret, Pom. Phys., 1830, 43) asserts that when certain pears are grafted on the quince, their seeds yield more varieties than do the seeds of the same variety of pear when grafted on the wild pear.—*Darwin's An. and Pl., II*, 312.

Two roses, one a light blush, finely formed but of undecided color, and the other very dark but not well formed, grew near each other. Buds of the light variety were inserted in the dark, which grew and retained all their habits of growth and foliage, as well as the form of the flowers; but the color, instead of a light and uncertain blush, was a rich, dark crimson, nearly but not quite as dark as the bloom of the stock.—*G. W. Campbell, Mich. Pom. Soc. Trans.*, 1877, 451.

We find that varieties like Jonathan and Domine will do well on very hardy, early maturing stocks, like Gros Pomier and Duchess, though they fail when root-grafted.—*Prof. J. L. Budd, of Iowa Ag. College, Letter of April* 12, 1879.

In some instances the stock exerts a marked influence upon the scion, thus showing the coöperative system in use between them. The "Gardener's Chronicle" mentions an instance of a couple of Muscat vines, worked on the Black Hamburg, in the same house with a Muscat on its own roots. Those worked on the Hamburg start fully five or six days in advance of the one on its own roots, although they are nearly a fortnight behind the Hamburgs they are worked on. It is a curious fact that there has never been seen any difference in the ripening season, nor any effect on the fruit.—*Josiah Hoopes, Proc. Am. Pom. Soc.*, 1873, 130.

Grafting the pear on the mountain ash is practiced in Nassau, and is said to retard the blossoming of the trees, and thus to adapt them for a climate where there is danger from spring frosts.—*Loudon's Gard. Mag.*, 1842, 228.

A scion of *Passiflora vitifolia* (*Tacsonia Buchanani*) was grafted on a stock of the variegated *P. quadrangularis*, and has subse-

quently shown variegated leaves.—*Florist and Pomologist*, 1876, 168.

The habit of the plant is sometimes altered by grafting. Thus *Acer eriocarpum*, when grafted on the common sycamore, attains in Europe double the height which it does when raised from seed. *Cerasus Canadensis*, which, in a state of nature, is a rambling shrub, assumes the habit of an upright shrub when grafted on the common plum. . . . The common lilac attains a large size when grafted on the ash; and *Tecoma radicans*, when grafted on the catalpa, forms a round head with pendent branches, which are almost without tendrils.—*Loudon's Horticulturist*, *ed.* 1841, 283.

Buds of *Bignonia grandiflora*, some of which were taken from a natural plant, others from a specimen of *B. radicans*, were grafted on a plant of the latter species. The first graft was a *trailer*, its wood *brown*. The second graft became a *shrub*, its wood *green*.—*M. Pepin*, *quoted by M. Chevreul*, *Jour. Lond. Hort. Soc.*, 1851, 98.

Mr. Fairchild, in 1721, grafted the holm or evergreen oak, (*Quercus ilex*) on the common oak (*Quercus robur*) as a stock, the result being, that while the leaves of the deciduous stock fell in the autumn as usual, those of the evergreen scion remained just the same as if on their own roots.—*Gard. Chron.*, 1871, 1100.

The stock has no other influence on the graft but that which the soil has on a plant; the latter will not grow in a soil which does not suit it, and the graft will only grow upon plants allied to it.—*H. F. Link*, *Jour. Lond. Hort. Soc.*, 1851, 42.

Following are instances of the Influence of the Scion on the Stock:

Henry Cane, in April, 1692, cut off a small plant of the common white jessamine, not larger than a tobacco pipe, at two joints above the ground and grafted with the yellow striped jessamine. It took, but grew feebly, and in four or five weeks died, and part of the stock died also, and was cut off. The next year it broke out at the joint below, with several shoots of the striped variety, and also made a strong shoot, from the root, of the striped variety. He tried the same experiment with several other variegated plants, but did not find any of them to transmute as the jessamine did.—*Phil. Trans.*, *abridged; Vol. VI*, *Part* 2, 341.

Suppose a plain jessamine tree with two or three branches from one common stem near the root. Into any one of these branches,

in August, inoculate a bud taken from a yellow striped jessamine, where it is to abide all winter, and in summer you find here and there some leaves tinged with yellow, even on the branches not inoculated, till by degrees in succeeding years the whole tree, even the very wood of all the tender branches shall be most beautifully striped and dyed with yellow and green intermixed. It is not material whether you cut off the branch above the inoculation to make the bud itself shoot. Even if the stock is not cut off and the bud does not shoot out, the same effect will be produced. Or if the bud lives but two or three months, it will in that time have communicated its virtue to the whole sap, and the tree will become entirely striped.—*The Clergyman's Recreation, by John Lawrence, London*, 1716, 65.

John Bartram, February 3, 1741–2, says, "Take a bud from a variegated jessamine and insert it into a plain jessamine; not only the bud will continue its variegation, but will also infect and impregnate the circulating juices that the branches and leaves above and below the bud will appear variegated."—*Darlington's Memorials*, 148.

When it is desired to turn a green jessamine into a variegated one, a single bud of either the silver-leaved or the golden-leaved will communicate its variegation to every part of the plant, even to suckers thrown up by the root. The same result takes place with the variegated laburnum, even if the bud should die, provided a portion of the bark to which it was attached continues to live. We have little doubt that the same thing would take place in various other plants.—*Loudon's Arboretum, II*, 1252.

Buds of a variegated jasmine were inserted in a plant of *Jasminum officinale*. The buds did not grow, but the bark of the stock closed up around them and healed over. The following year golden-variegated branches appeared in the plant.—*D. Wooster, at Royal Hort. Soc. Meeting, Aug.* 4, 1875.

It is notorious that when the variegated jessamine is budded on the common kind, the stock sometimes produces buds bearing variegated leaves. Mr. Rivers, as he has informed me, has seen instances of this.

The same thing occurs with the oleander (Gärtner, Bastarderzeugung, s. 611, gives many references on this subject).—*Darwin, An. and Pl., I*, 473.

A line of laburnums were budded in 1876 with a variegated

variety; most of the buds died, but the next summer many of the stocks were variegated precisely like the variety which was budded on them. In another case several laburnums were budded about five feet high with a new golden variety. The buds mostly took, and suckers on the stock, some nearly down to the ground, assumed a beautiful golden yellow hue just like the sort budded.—*The Garden*, *XII*, 250.

A scion of a golden-leaved laburnum was budded on a green-leaved laburnum as a stock. The buds were inserted at two or three feet from the ground, and in the course of a few months not only did some of the green-leaved stocks produce golden-variegated branches below the point of union, but pure golden stolons or suckers were thrown up from the root. — *Royal Hort. Soc. Meeting*, *Aug.* 4, 1875.

Mr. Purser states (believed by Dr. Lindley in Gard. Chron. 1857, 382, 400) that a common laburnum tree in his garden, into which three grafts of the *Cytisus purpureus* had been inserted, gradually assumed the character of *C. Adami;* but more evidence and copious details would be requisite to make so extraordinary a statement credible.—*Darwin*, *An. and Pl.*, *I*, 467.

The variegated variety of the *Castanea vesca* had been grafted, standard high, on an ordinary green-leaved sweet chestnut stock. The graft took, but from some cause or other afterwards died off; and subsequently a young shoot, with well marked variegation on its leaves, broke out from near the base of the stem.—*Burbidge*, *Cultivated Plants*, 61.

Passiflora Raddiana (*kermesina*) and *P. Impératrice Eugénie* were inarched with the variegated *P. quadrangularis aucubœfolia*. From the branch above the graft branchlets were produced which bore variegated leaves, from which cuttings were taken which have perpetuated the two variegated varieties thus produced.—*Florist and Pomologist*, 1876, 168.

About 1722 Mr. Fairchild budded a passion flower whose leaves were spotted with yellow into a variety with plain leaves, and though the buds did not take, yet after it had been budded a fortnight the yellow spots began to show themselves about three feet above the inoculation, and in a little time after that the yellow spots appeared on a shoot which came out of the ground from another part of the plant.—*Gard. Chron.*, 1871, 1100.

During the past season a mountain ash upon which was budded

a variety with variegated leaves, commenced to push forth young shoots from the main body of the tree below the point where the bud was inserted. In every case these had variegated leaves. Now in view of the fact that these *adventitious* buds were there in advance of the original variegated bud, the presumption is that they were created green and that their normal condition yielding to the controlling influence of the new branches, caused the change to occur by the flow of sap from above. Other instances are mentioned.—*Josiah Hoopes, Proc. Am. Pom. Soc.*, 1873, 130.

Three years ago a bud of the blood-leaved variety of *Betula alba* was put into a strong stock of *B. alba*, var. *populifolia*. After the bud had grown a foot it was accidentally knocked out. Over the place where it grew a bud of cut-leaved birch was inserted, which, growing, preserved the stock. Last spring, several inches below where the blood-leaved bud was inserted, a branch of a blood-leaved color put forth, showing that the coloring principle existed in the stock ten months after all the foliage had been destroyed. The new bud from the *populifolia* stock is the true European *alba*, showing that more than mere coloring had been transmitted.—*T. Meehan, in Bot. Gaz.*, 1879, 165.

William Reid asserted that variegated willows would transmit their influence to the stock.—*Gard. Month.*, 1869, 292.

Mr. Brown, of Perth, observed many years ago, in a highland glen, an ash tree with yellow leaves; and buds taken from this tree were inserted into common ashes, which in consequence were affected, and produced the Blotched Breadalbane ash.—*Darwin An. and Pl.*, *I*, 473.

Mr. Rivers, on the authority of a trustworthy friend, states that some buds of a golden-variegated ash, which were inserted into common ashes, all died except one, but the ash stocks were affected (a nearly similar account was given by Bradley, in 1724, in his "Treatise on Husbandry," I, 199) and produced both above and below the points of insertion of the plates of bark bearing the dead buds, shoots which bore variegated leaves. Mr. J. Anderson Henry has communicated to me a nearly similar case.—*Darwin An. and Pl.*, *I*, 473.

The influence of a graft of variegated abutilon ceased when the graft was removed.—*Gard. Chron.*, 1869, 554.

The variegated *Pittosporum Tobira* was worked on a green-leaved stock of the same species, and though the graft did not take

the contact was sufficient to cause the production of a variegated shoot below the graft.—*Gard. Chron.*, 1870, 664.

Violet-colored tubers of potatoes grafted on white produced only negative results, but it was not so with young shoots. On a plant with four shoots with green foliage, one shoot was cut down and grafted with a variety having violet-colored foliage. A fortnight after the operation the stock was of a lively carmine red, and the growing scion was of a more violet tinge.—*Gard. Chron., N. S., IX*, 662.

According to De Candolle (Physiologie Végétale) each separate cellule of the inner bark has the power of preparing its food according to its nature; in proof of which a striking experiment has been tried by grafting rings of bark, of different allied species, one above another on the same tree, without allowing any buds to grow upon them. On cutting down and examining this tree, it was found that under each ring of bark was deposited the proper wood of its species, thus clearly proving the power of the bark in preserving its identity even without leaves.—*Downing, Fruits, ed.* 1845, 24. Professor J. P. Kirtland, in commenting on this and connectep passages, says, "A graft of the *Green* Newtown Pippin will invariably render the bark of the stock rough and black (the habit of the variety) within three years after its insertion."—*Horticulturist, II*, 544.

If we cut up a long root of a seedling apple and insert scions of different varieties, a part on each root, the young trees which result from these grafts will have roots unlike each other. The difference may be very slight or it may be very apparent. The scion, then, influences the form of growth in the root.—*Prof. Beal, Ag. of Mich.*, 1876, 203.

Not only are root-grafts of this (the Northern Spy) certain to root from the graft, but when budded or grafted on seedlings it will develop in them a tendency to form a great many fibrous roots. —*B. Hathaway, Ag. of Mich.*, 1871, 127.

The gardener who in 1644 in Florence raised the Bizzarria orange, declared that it was a seedling which had been grafted, and after this graft had perished the stock sprouted and produced the Bizzarria.—*Darwin, An. and Pl., I*, 470.

A potato scion set into a tomato plant induced the latter to set small tubers in the axils of its leaves, as we see sometimes on the tops of potatoes. The grafting of an artichoke plant into a sun-

flower caused the latter to set tubers under ground.—*Prof. Beal, Ag. of Mich.*, 1876, 204.

The following relate to the Reciprocal Influence of the Stock and Scion:

Whatever opinions may have formerly prevailed among orchardists, it is now generally conceded by intelligent writers and cultivators that the stock affects the fruit of the scion in quality, productiveness, and time of bearing; and that the scion increases or retards the growth of the stock, and in some instances imparts its own peculiarities to the root.—*A. C. Hammond, Trans. Ill. Hort. Soc.*, 1870, 314.

The graft and the stock do, however, exercise a certain amount of reciprocal influence, the one on the other; and in certain cases hybrids or intermediate forms between the two are produced.—*A. W. Bennett, Thomé's Bot.*, 182.

A variegated plant, whether used as a stock or scion, has the faculty of imparting its variegations to the leaves and buds subsequently produced.—*Gard. Chron.*, 1870, 315.

A writer in the *Journal de la Société Imperiale, etc.*, assumes an effect of the stock on the scion, and from it argues the effect of the scion on the stock, "As the scion is modified in its fruit, its leaves, its growth, its vitality, it is quite natural that the stock should be also modified in its constitution by the graft."—*Hovey's Magazine*, 1863, 396.

Gärtner (Bastarderzeugung, s. 619) quotes two separate accounts of branches of dark and white fruited vines which had been united in various ways, such as being split longitudinally, and then joined, etc.; and these branches produced distinct bunches of grapes of the two colors, and other bunches with grapes either striped or of an intermediate and new tint. Even the leaves in one case were variegated.—*Darwin An. and Pl., I*, 474.

My Monstrous Pippin was grafted near the ground about thirty-five years ago. It soon begun to bear superb fruit; large and fair, but too tart to eat raw. About twenty years ago I sawed off five of the limbs and grafted with a sweet apple called Hay Boys. Soon the Monstrous Pippin grew milder until it has become a sweet apple, though the Hay Boys is not so sweet as formerly.—*Stephen Adams, in Germantown Telegraph.*

Many instances of the influence of the stock on the scion are

given in the TRANSACTIONS of this Society for 1878, Part I, pp. 83 and 84; and 1879, Part I, pp. 7–11, 18, 22, and 25–33. In the "New England Farmer," Vol. XI, p. 97, is an interesting paper on the "Reciprocal Influence of the Stock and its Graft," communicated to this Society by James Mease, M. D., of Philadelphia, an Honorary Member, which was read at the meeting on the 29th of September, 1832, in which he gives many instances of this influence. Dr. Mease says, "In France they used to graft the same sort over and over again three or four times on the same stock." In a communication published in the same journal, Vol. XII, p. 75, he gives additional cases. In the "Gardeners' Monthly," for 1876, p. 306, is an account of some experiments in bud grafting.

The effect of the quince in dwarfing the pear and bringing it into bearing is so well known as to require only an allusion, as is also that of other dwarf stocks. Instances of the effect of variegated abutilons on the stocks on which they were grafted are so numerous and universally admitted that mere mention of them is sufficient.

Dr. Sturtevant repeated that the influence of the stock and graft on each other should not be confounded with bud variations. There is a variegated coffee tree in the Department of Agriculture, at Washington; if this had followed the grafting, it would have been ascribed to the grafting. Change of form in leaves is common, and also form of tree. He had seen the beech tree in the form of a column. Graft hybrids are yet rather rare, and, consequently, we know little concerning them. The immediate effect of pollination, denied by Professor Eaton, is shown by the fact that the melon was largely influenced the same year. There is a probability that this influence is more frequent than is usually supposed. Irritation sometimes causes the formation of fruit without the action of pollen.

Charles M. Hovey spoke of the subject as one in which he was much interested; and he was glad to hear of the general interest in it. He had read and thought a great deal upon it, as well as observed for fifty years. The mutual influence of the stock and graft should be kept distinct from sports. He had very little respect for the opinions of botanists on simply physiological subjects. He quoted the views of Thomas Andrew Knight on the subject as follows:

"Many gardeners entertain an opinion that the stock communicates a portion of its own power to bear cold without injury, to the species or variety of fruit which is grafted upon it; but I have ample reason to believe that this opinion is wholly erroneous, and this kind of hardiness in the root alone can never be a quality of any value in a stock, for the branches of every species of tree are much more easily destroyed by frost than its roots. Many, also, believe that a peach tree, when grafted upon its native stock, very soon perishes, but my experience does not further support this conclusion than that it proves seedling peach trees, when growing in a very rich soil, to be greatly injured, and often killed, by the excessive use of the pruning knife upon their branches, when those are confined to too narrow limits. The stock, in this instance, can, I conceive, only act injuriously by supplying more nutriment than can be expended, for the root which nature gives to each seedling plant must be well, if not best, calculated to support it; and the chief general conclusions which my experience has enabled me safely to draw, are, that a stock of a species or genus, different from that of the fruit to be grafted upon it, can rarely be used with advantage, unless where the object of the planter is to restrain and debilitate, and that, where stocks of the same species with the bud or graft are used, it will generally be found advantageous to select such as approximate in their habits and state of change, or improvement from cultivation, those of the variety of fruit which they were intended to support." *

Mr. Hovey said that a pear tree grafted on the quince, gives entirely different growth from one on the pear, and pears are higher colored from such a tree. The plum stock does not give the supply of sap to the peach that the peach stock does. If every stock influenced the graft, we should have no Bartlett pears or Baldwin apples, but these are all the same as he knew them when a boy. These, and the Vicar of Winkfield and Winter Nelis pears, the Green Gage plum, the Jacques and George the Fourth peaches, the Black Tartarian cherry, the Double White camellia, and the Gen. Jacqueminot rose, have been grafted millions of times on seedling stocks, and are still unchanged. The purple beech is the same throughout, and many others might be named.

Mr. Hovey stated that the observations of Mr. Knight extended

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* Horticultural and Physiological Papers, page 223.

over forty years, and his own over fifty years. He had grafted late varieties on the Madeleine and other early pears without hastening their ripening, and he doubted the statement that this effect was produced on the Styrian or Keele Hall pear, when grafted on the Madeleine. He mentioned a case in his own grounds, where it might have been supposed that a Beurre Bosc pear had been changed, but, on careful examination, it proved that a graft of the Lewis pear (probably cut from a sucker) had been inserted instead of the Beurre Bosc. An alleged case of the change of Beurre Clairgeau by grafting on the Aston Town (quoted by the "Rural New Yorker" from the "Gardeners' Chronicle"), might probably be explained in the same way. Loudon laid down the principle that grafts from all variegated trees would infect the stock, but the speaker discussed the subject only so far as respects influence on the character of the variety. He has Seckel pear trees grafted on hawthorn stocks, but never saw little haws on them; on the contrary, they bore the finest Seckels he had the previous year. There is no instance, to his knowledge, where it can be shown that when the true variety was grafted, it has changed. If trees could be made hardier by grafting on hardy stocks, that would be a very important point; but the idea of acclimation by this means is utopian.

The Chairman said that Mr. Hovey had decided the matter to his own satisfaction, but he thought there might still be a question whether the stock does not hasten the maturity of fruit.

O. B. Hadwen said, in allusion to the reported early ripening of fruits grafted on early varieties, that he had noticed that the Northern Spy and Holden Pippin apples ripen earlier in cultivated ground than in grass, even though the latter is ploughed occasionally; but, on one farm, the Holden Pippin is several weeks later than the general crop. Though he had raised twenty-five acres of apple orchard, from seed, he had never seen a single instance where he was satisfied that the stock had influenced the graft. Nor could he recall an instance where he could say that the pear or plum had been so influenced. Apples vary on different trees, and on the same tree, but the stock should influence all alike. He attributed the superiority of the fruit of one tree over another, to a difference in culture or soil. He did not wish nurserymen to think that the stock would influence the scion. Botanists say that there are instances, but the weight of evidence is in another direction. If a

graft had been taken from a Baldwin tree which had varied, and inserted in the original Baldwin tree, it would doubtless have regained its original characteristics.

Mr. Hovey again referred to Mr. Knight's views, and pronounced the statement that the Double Yellow rose was made to grow freely and open its flowers, by grafting on the China rose, an absurdity.

N. B. White thought the late ripening of apples in grass ground might be owing to the frost being kept longer in the ground. He had mulched pears heavily to keep the frost in and retard the blossoming, and in that way had got better pears, as the curculio does not attack the fruit from late blooms so much as that from earlier. He grafted a Porter apple tree for a neighbor, with scions of the same variety taken from a tree which produced remarkably fine fruit. At the same time he cut scions from the tree which he was grafting and put them in, and when they fruited he could not discover any difference. He thought the variations of which so many instances had been adduced were simply sports ; and said that, though it is interesting to get the facts together, they do not establish any principle.

Edmund Hersey said that when he was a boy his father purchased a piece of land on which was an apple tree that always dropped its fruit before it was ripe. His father grafted one side of the tree with the Rhode Island Greening, and when the grafts bore, the fruit partook of the character of the stock with regard to dropping. The greatest number of apples ever gathered from the tree was twelve. The dropping might have been due to the soil. His father bought another piece of land on which was a natural apple tree which bore enormous crops, but every apple had a peculiar rot on one side ; they would hang until frost came, but when gathered a quarter part would be rotten. Twenty-five scions were inserted in the tree, not one of which took, and it was afterwards budded with summer, autumn, and winter kinds—sweet and sour, and of all colors. The rot affected all the kinds ; there never was a peck of apples free from it. A Baldwin tree was planted close to it and the old tree cut down ; the Baldwins never rotted. The tree when cut down was somewhat rotten in the top ; it had previously been very sound. The speaker thought these facts positive proof that the stock does influence the scion. His father had two Baldwin trees, one of which, by the roadside, bore very handsome fruit, though not very large ; the other tree, which grew by the side of the

barn, bore larger fruit. When the latter was large enough to bear two barrels of apples it was removed to the roadside, and has continued to bear large, though not so uniform sized, apples.

D. W. Lothrop thought it useless to discuss the influence of the scion on the stock, unless we can show some benefit to be derived from it. The influence of the stock on the scion is more important. The late Samuel W. Cole believed in this influence and wrote upon it in his "American Fruit Book" and in the "New England Farmer" which he edited. But when he had presented to him a barrel of Red Russet apples, which had a firmer flesh and kept longer than the Baldwin, and was told that the variety was produced by grafting a Roxbury Russet tree with Baldwin grafts taken from the same tree as those used in the trees around, Mr. Cole could not believe in quite so much influence. We may admit slight changes, but not the production of a new variety, and the changes may not be in the direction of improvement. The speaker had a harsh pear which he grafted with Winter Nelis, and the fruit of the grafts was green, not larger than walnuts, inclined to crack, and uneatable. This was apparently a perfect instance of the influence of the stock on the scion, although the influence might afterwards have been out-grown. The leaf and habit of the tree were still the true Winter Nelis. The tree was grafted with another kind, which was not influenced by the stock. He has the Red Astrachan apple grafted on the Gilliflower, and the fruit is just as acid as any other.

The Chairman thought we could say that we know the influence of the stock on the graft is proved, and that it may be propagated. As to the influence of the graft on the stock, every nurseryman knows that the character of roots is changed, and that the roots of a row of Baldwin apple trees in the nursery will be alike, and the roots of a row of Roxbury Russets will be alike, and will differ from those of the Baldwins. Each row can be told by its roots.

Mr. Hadwen confirmed what the Chairman had said of the influence of the grafts on the roots of stocks. If part of the same lot of pear stocks are grafted with Bartlett and part with Onondaga, the two varieties can be distinguished by the roots. The Roxbury Russet under high cultivation gets to resemble the Greening in appearance. He had known a tree standing by a hog-pen, where the fruit grew very large and had scarcely any russet. This might have been wrongly attributed to the stock.

Benjamin G. Smith thought that some very notable examples of the effect of the stock on the graft had been adduced. He mentioned the very fine Winter Nelis pears exhibited by John L. Bird, which were produced by grafting on vigorous stocks, like the Vicar of Winkfield. Mr. Smith had increased the size of some of his pears from one quarter to one half in this way, but at the expense of quality. They were grafted into the tops of the trees; on the side branches the size would not be increased. He had grafted four or five kinds of apples on the Dutch Codlin, and all grew equally well.

Mr. Hovey said that Seckel pears would not be increased in size by grafting on side branches. He thought that neither the size nor the quality of fruit was changed by grafting. There are many conditions to be provided for in preparing for a crop of fruit. He had never known a variation of any kind, in quality, or any other respect, in all his experience in grafting.

Aaron D. Capen said that he has two trees of Vicar of Winkfield standing very near together, one of which invariably bears good fruit, and the other never, which he could attribute only to the effect of the stock, there being no difference either in the soil or treatment.

Mr. Hovey said that one year he had fifty bushels of Vicar of Winkfields, very few of which were fit to eat; afterwards he had crops all of which were fine.

Benjamin P. Ware mentioned an instance, which he learned from Major D. W. Low of Gloucester, of a Bartlett pear tree standing in a neighbor's grape border, which bore only very small, poor fruit. This appeared to be an instance of the influence of the stock on the scion; but Mr. Low removed the tree to his own grounds and now it bears as good fruit as can be found.

Mr. Ware spoke of an apple presented by Gideon R. Lucy, for the premium of one hundred dollars, offered by the Essex Agricultural Society for a new and superior winter apple. The variety offered was said to have been originated by grafting the Baldwin and Roxbury Russet into each other over and over again, but how many times was not stated. Specimens were shown at the fair of the Essex Agricultural Society, last fall, and were pronounced identical with the Red Russet. Not a particle of evidence has been produced that the statement of its origin by repeated grafting was correct. Professor Maynard, of the Massachusetts Agricul-

tural College, (who believes in the influence of the stock on the scion), had a variety said to have originated in a similar manner, shown him, and a Mr. Lothrop had a similar claim. Mr. Ware read a letter to Professor Maynard, from George F. Eastman, of South Hadley, concerning the apple shown to Professor Maynard. Mr. Eastman received the statement from his father, on whose farm the tree grew. From this letter, it appeared that the tree was budded by the elder Mr. Eastman in the nursery row, with Roxbury Russet, but, before transplanting, and before it had borne fruit, was changed from Roxbury Russet to Baldwin, with the exception of two limbs, which were left by mistake, and bore Russets. The rest of the tree bore Baldwins, and as it was desired to have the tree wholly Baldwin the Russet limbs were cut off. Several years afterwards it was noticed that a limb just over where one of the Russet limbs had been cut off, bore apples different from those on the rest of the tree, and they have continued to do so for three or four years. These are Red Russets and they keep better than the Baldwin, and nearly as well as the Roxbury Russet. All the apples on this limb are Russets. It bears quite as well as the rest of the tree (which is Baldwin), and has always borne the odd year, and never in the even year.

Mr. Ware said there was no certain evidence that the stock supposed to have been grafted with Roxbury Russet in the nursery row, was not omitted in grafting (in which case the limb bearing Red Russets was part of a seedling tree), or that it was not grafted with Red Russet.

He referred to the statement that sweet oranges, when grafted on wild stocks, revert to the wild state in a few years (TRANSACTIONS, 1879, Part I, page 23), and said that the apparent deterioration was caused by the suckers crowding out the graft. He had been unable to trace out any evidence that the quality of fruit had changed through the influence of the stock. He quoted from an address delivered by him before the Essex Agricultural Society in 1869, the opinion that while the graft has an influence in forming the habit of the roots of the stock, the stock exerts no influence upon the variety of fruit grafted into it; and said that his views on these points were unchanged. He had found nurserymen and tree pedlars selling trees as better, because double worked, but thought it an imposition.

The Chairman thought the subject of more practical importance

than it was considered by some. Roses, particularly those of weak growth, will give a much more magnificent bloom when worked on the Manetti stock, than those on their own roots.

Mr. Hadwen said the Red Russet is well known in Worcester county, and that he never heard it called a cross between the Baldwin and Roxbury Russet. It is neither Baldwin nor Roxbury Russet, but is as distinct in form, color, texture, and juice, as any variety.

The Chairman said that in budding a row of Bartlett pears, for example, we find some much more vigorous than others, which he thought the effect of the stock.

On motion of Leander Wetherell, it was voted to continue the discussion of the subject on the next Saturday.

MEETING FOR DISCUSSION.

Saturday, March 13, 1880.

A meeting for discussion was holden at 11 o'clock, W. C. Strong, Chairman of the Committee on Publication and Discussion, presiding. The subject was the Influence of the Stock and Graft, continued from last week.

Benjamin P. Ware brought up the three cases mentioned last Saturday, in which it was claimed that a new variety of apple, known as the Red Russet, had been produced by grafting the Baldwin on the Roxbury Russet. The appearance of these three cases was very remarkable. The Red Russet is not, by any means, a new variety. Specimens of Mr. Lucy's apples were here exhibited by Mr. Ware.*

In all his experience he had never known an instance where such changes as these alleged could not be explained otherwise than by

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* It has since been ascertained that the apples offered by Mr. Lucy for the premium for the best new seedling, were the Red Russet, which originated on the farm of Aaron Sanborn, of Hampton, N. H., about 1840. The account given by the family of Mr. Sanborn, who is now dead, is that an orchard of Roxbury Russets was grafted with Baldwin, and that all the trees bore Baldwins, except one, which produced the Red Russet. (See Transactions of the Essex Agricultural Society for 1880, page 127.)

the influence of the stock. Some of the quotations from Darwin and others, commenced, "it is said," but did not inform us who said it.

Leander Wetherell asked how Mr. Ware rebutted the testimony in the three cases alleged.

Mr. Ware replied, that by following back the statements he found there was no foundation for them.

Charles M. Hovey agreed with Mr. Ware. The oldest English and French writers speak of the influence of the quince and Paradise stocks in dwarfing apples and pears; but the influence we are now discussing, is supposed to be upon the character of fruit. Mr. Hovey here quoted from an article by Mr. Knight, the remark that Dr. Erasmus Darwin's imagination was too strong for his judgment, and expressed the opinion that the case was the same with his distinguished, but younger kinsman.

Mr. Hovey thought the views expressed in Dr. Sturtevant's quotations from Downing did not agree with the following passage from page 27, of the edition of 1872: "The well-known fact that we may have a hundred different varieties of pear on the same tree, each of which produces its fruit of the proper form, color, and quality; and that we may have, at least for a time, several distinct though nearly related species upon one stock, as the peach, apricot, nectarine, and plum, prove very conclusively the power of every grafted or budded branch, however small, in preserving its identity." The speaker did not wish it to go out to the world that many of the members of the Society believe that the roots of trees are influenced to any extent by the variety grafted on them. Of course, this would be the case when root-grafted trees root from the graft, but if we graft a weak growing rose on the Manetti stock, do the roots become weak? If so, what would be the object? When the apple is grafted on the Paradise stock, the pear on the quince, the tree pæony on the tuberous rooted pæony, the fibrous rooted *Ipomœa* on the tuberous, or the double flowering almond on the plum, are these stocks influenced by the grafts? If the stock influences the time of ripening of the fruit of the graft, we might get Bartlett pears much earlier by grafting on the Amiré Joannet, or later, by grafting on Vicar of Winkfield; but he had never seen a really good, ripe Bartlett, earlier than the 8th of September, or later than the 25th. He had grafted Clapp's Favorite on Jargonelle, Dix, Beurre d'Aremberg, Columbia, Glout Morceau, Beurre Diel,

and Flemish Beauty; Dana's Hovey on Gustin's Summer, Harvard, and Vicar of Winkfield, and Bartlett on Winter Nelis, Easter Beurre, Belle de Thouars, Green Chisel, Onondaga, and Vicar of Winkfield, without changing the season of ripening in the least. In 1862 he sent to market a bushel or more of each of one hundred and fifty kinds of pears, and many other varieties in less quantities; in 1880 he had but a hundred kinds. The reduction had been effected by grafting over the trees of the less valuable kinds with the standard sorts; but, among all these varieties, none of the stocks affected the grafts. If grafting a late pear on an early one makes it earlier, grafting an early pear on a late one ought to make it later. As to the increase in the size of Mr. Smith's Seckels, spoken of last week, and attributed to the vigorous stock, Mr. Hovey said that cultivation has much to do with increasing the size of fruit. He did not doubt the statement made by Mr. Hersey at the same meeting, in regard to the dropping of the apples, but this could be accounted for in a thousand ways.

J. W. Manning had repeatedly noticed that the roots of trees grafted with Siberian Crabs generally run down more than those of other trees, which he attributed to the influence of the graft. He had never seen the roots of dwarf trees run down.

Mr. Talbot had seen nurserymen designate pear trees by the roots, though all were budded on French seedling stocks. Mr. Weston grafted the Bartlett on the Easter Beurre, and the fruit was twice as large, and kept two weeks longer than that from grafts on natural stocks.

Mr. Hovey doubted whether any one could tell a Winter Nelis pear tree by its roots. This variety does not grow as strong as some others—the Vicar of Winkfield, for instance—and in a weak growing tree the roots will be proportionally weak. We do not generally graft on weak stocks.

Washburn Weston gave an account of the change in the Hightop Sweetings, mentioned last year. He was gardener to Dr. Ira Warren, who wished to have some Hightop Sweet apples, and procured grafts which he inserted in Red Astrachan trees. The fruit produced was neither Hightop nor Red Astrachan. It was not a red apple, but white with a red cheek, like the Maiden's Blush. It ripened at the same time with the Red Astrachan. Grafts from it were put on a Russet tree, from which fruit was shown, resembling the Red Astrachan in form, but sweet. They

grew in clusters like the Red Astrachan. The grafts on Red Astrachan ripened their fruit in August; that of the grafts on the Russet keeps till March, though then past its prime. Dr. Warren has had, since the Red Astrachan was first grafted with Hightop, eight or nine gardeners, two of whom are alive now.

Mr. Washburn's Bartlett pears all ripened about the middle of September, except those grafted on the Easter Beurre, not one of which was ripe on the 12th of September. His father grafted two Talman's Sweet apple trees with Red Astrachan, and the fruit was much less acid than usual, and also more oblong in shape than when grafted on the Greening. He had found the Hubbardston Nonsuch grafted on the Large Yellow Bough much sweeter than it generally is. He believes that the soil has an influence on the quality of the fruit.

The Chairman requested the Secretary to read from his notes, Mr. Hovey's expression of ignorance of any effect of the stock on the scion. The minute was as follows: "Mr. Hovey had never known a variation of any kind in quality or any other respect in all his experience in grafting." The Chairman thought it must appear strange to those outside of the Society that so much difference of opinion should exist here on this subject. He was not prepared to say that he had observed any radical and permanent change, such as the production of a new variety like the Red Russet, by grafting the Baldwin on the Roxbury Russet; but this is very different from influencing and changing the character so long as the graft remains on that stock. Of this he had noticed so many instances that he was convinced that there is a modification from this cause. The opening sentence of the passage read from Mr. Knight had escaped Mr. Hovey's observation. We should bear in mind that the question is not whether varieties are radically changed, but whether they are influenced at all. Why should not the size of fruit be influenced by the stock as well as the size of roses? If we change the size of fruit do we not change its character? The ordinary pear stocks imported from France and raised from the wild pear are not as vigorous as the kinds grafted on them. When we get a cultivated variety on them we get a more vigorous growth, and it changes the root of the stock. If we could get stocks with the vigor of the Bartlett, Vicar of Winkfield, or Buffum, they would be more valuable than the imported seedlings. The speaker objected to the ridicule cast on the subject by some persons. Mr.

Hovey had defied any one to produce proof of *Magnolia glauca* being rendered more hardy by grafting on *M. acuminata*, but this is not a fair test. If it causes the graft to grow late it may be less hardy. It is beyond dispute that *M. acuminata* does impart great vigor to such species as *glauca*, *Soulangeana*, *Thompsoniana*, and *Lennei*.

E. W. Wood thought that Mr. Hovey, in stating that he had never seen any influence of the stock on the graft, meant to limit it to the change of varieties. The quotation from Mr. Knight, in regard to the two Acton Scott peach trees, is a strong argument in support of the belief that the stock does influence the graft. Mr. Knight had budded the trees himself. We do not desire to obtain new varieties by grafting, but we may desire modification. The account given of the origin of the Red Russet, is generally accepted. All practical growers know the necessity of growing some pears on quince and some on pear stocks. There is not one Duchesse d'Angouleme pear in a hundred, grafted on a pear stock. On the quince it will bear in five years; on the pear it takes fifteen. If Mr. Hovey does not graft roses he is in conflict with all the principal rose growers of Europe.

Mr. Hovey said that he did not come here to controvert the statement in regard to the Duchesse d'Angouleme when grafted on the quince. But there is no fruit that will not be better when grafted on its own root. He would rather have a tree of Doyenne Boussock, on the pear stock, bearing ten bushels of pears, than to have fifty trees on quince, bearing the same quantity. The best cultivators of fine specimen roses say that they will do as well on their own roots as grafted. If every stock is to partake of the character of the variety grafted on it, nothing is gained by grafting. The object of grafting the *Magnolia glauca*, which is a bog plant, on *M. acuminata*, is to adapt it to soil of a different character from that in which it naturally grows. *M. acuminata* has strong roots. *M. Soulangeana* is grafted because it makes a tree sooner than on its own roots, and not to change the character of the variety. The idea that the Red Russet apple was produced by grafting is absurd.

The Chairman said that the question whether new varieties are produced by grafting, is only incidental to the subject under discussion.

Benjamin G. Smith said that Mr. Hovey was correctly reported

as saying that he had never known a variation of fruit in quality or any other respect in all his experience in grafting, and asked whether he wished the statement to be understood without qualification.

Mr. Hovey replied that he had no qualification whatever to make except in regard to dwarfing the graft.

N. B. White said that a Mr. Page, of Dorchester, exhibited Delaware grapes which bore a strong resemblance to Dianas, and stated that the change was caused by grafting them on the *Labrusca* stock, but he doubted the correctness of the statement.

Patrick Norton thought that weak growing roses were improved by grafting on strong stocks; the Yellow Tea on the Tailby stock for instance. Hardy Hybrid Perpetuals grow much stronger and produce finer flowers when grafted on strong stocks. The roots of Manetti stocks do not become like those of Tea roses when the latter are grafted on them.

D. W. Lothrop thought there was but little use in collecting all these instances of the influence of the stock on the graft, if we cannot deduce from them any fixed scientific principles. If we graft the Hightop Sweet into the Red Astrachan and it is changed, the character of the change cannot be foretold. The great law is that the scion is not affected. The sap is elaborated in the leaves and carried down into the stock, and it would seem reasonable to suppose that, in four or five years after grafting, when the scion has made a great deal of wood, shoots from the stock would bear a modified fruit. But it is not so. Perhaps we must admit that there is some influence of the stock over the scion as to vigor and ripening. He regarded the various influences claimed as merely freaks of nature, governed by the "law of disorder." To utilize these influences, our knowledge of them should be systemized; but if results are not always alike from the same plain causes, it cannot be done.

Joseph H. Woodford thought that all the arguments presented at this meeting went to prove that the stock and scion do influence each other. Governor Claflin's gardener told him that grafting the variegated trailing abutilon on the strong green-leaved kinds would cause variegations in the stock. He did not believe it, but tried the operation in his own greenhouse and got variegated suckers from the stock, which retained the variegations when propagated.

Mr. Hovey admitted the influence of the variegated abutilon on stocks of the plain kinds. He had illustrated this in a paper read before the Society at one of its discussions five years since. Loudon long ago made the remark that this variegation affected the stock, and was therefore supposed to be a disease which could be communicated by grafting.

J. W. Manning said that in 1849 he was employed by Mr. Cole, who then had young trees of the Red Russet in his nursery. Their growth was similar to that of the Baldwin, but stronger. The Black Oxford apple grows very strong and upright, and the roots run equally deep.

Joseph Tailby thought that the subject under discussion was exhausted last year. He had never seen any change in roses from grafting. The only reason for grafting roses is to make plants more quickly. You get stronger growth because the stock is established. He had seen Black Hamburg grapes grafted on the Barbarossa, and the foliage was larger, but the flavor was not as good as that of fruit from plants on their own roots. The berries and bunches were not any larger than usual.

The Chairman expressed his belief in the practical utility of discussing this subject.

Mr. Talbot thought that the solution of the questions under discussion would be found by the study of vegetable physiology. At present the subject appears confused, but all systems are evolved from disorder.

The Chairman read a letter from Charles Downing, of Newburgh, N. Y., the eminent pomologist, in which, after expressing his interest in the discussions of the influence of the stock on the graft, as printed in Part I of the Transactions for 1879, he said, "There is no doubt that in large trees, top-grafted, the stock has more or less influence, but when grafted or budded on small stocks, near the ground, the influence, if any, would be little." The speaker had bought pear stocks in former years, for which he paid a high price because they were said to be free from leaf blight. This proved to be incorrect, but the principle is correct. If we could get such stocks from selected Vicar of Winkfield seeds, or from the Chinese Sand pear, they would be valuable. They might impart vigor to the kinds grafted on them.

Mr. Hovey asked why we wanted such vigorous stocks. They are more liable to blight than moderate growers. Orchards laid

down to grass do not generally blight, and short-jointed growers are not so apt to blight. Mr. Quinn says that the Chinese Sand pear has blighted more than anything else.

Leander Wetherell thought that the most impressive lesson to be learned from the discussion is that the unknown has greatly the advantage over the known. The evidence is not conclusive on either side, and we ought to observe with more care. Professor Agassiz said that when we discuss what we understand, we agree; but when we get to subjects that we do not understand, we differ and wrangle.

The Chairman announced that on the next Saturday there would be a discussion on Rose Culture, to be opened by Joseph Tailby.

MEETING FOR DISCUSSION.

SATURDAY, March 20, 1880.

A meeting for discussion was holden at 11 o'clock, William C. Strong, Chairman of the Committee on Publication and Discussion, presiding. The subject for discussion was Rose Culture, and was opened by Joseph Tailby.

Mr. Tailby spoke first of the different methods of propagation, illustrating his remarks by two plants, one grafted, the other grown from a cutting of hard wood. The former was a much finer plant than the latter. It is almost as easy to propagate Hybrid Perpetual roses from cuttings of green wood as Tea roses, but he was never successful with short cuttings of hard wood. A short cutting will callus, but will not form roots. A long cutting may have, perhaps, a dozen eyes, each one of which would have made a plant if grafted. He had been most successful with cuttings when they were taken off with a little heel of bark. He grafts with a simple splice, though tongueing holds the scion in place while tying. The plant shown was grafted the 8th or 9th of January, on a Manetti stock which was potted in December, and when grafted had grown about an inch. They generally flower as early as this time. The wood of imported roses is more solid

than that of plants grown here. The wood of this was not ripe enough when grafted. They need a little heat after grafting to excite growth.

The Chairman said that he had recently visited Mr. Tailby's plant houses, and was very much pleased with their appearance. He was especially struck with his success in grafting.

Mr. Tailby went on to say that roses bloom as quickly when grafted as when raised from cuttings, or even more quickly, and make strong plants sooner. He thought the flowers were better also. A plant on its own roots will take two or three years to become as strong as a grafted plant of one year; then it may be as good as a grafted plant, but you get stronger growth from the graft to commence with. He was of the opinion that all Hybrid Perpetual roses, even Gen. Jacqueminot, are better grafted. He always uses the Manetti stock, and thought it would make a good stock for ever-blooming roses—as good as Laure Davoust. It is good in light soils, but not as good as the brier in heavy soils. It is one of the finest for an inside border. It could be grown in one year so as to graft or bud standard high. He did not think it would suffer from heat so much as the brier. It is vigorous, and, if the cuttings are properly prepared, will not throw out suckers.

The Chairman expressed the opinion that the Tailby stock suffers when budded high, especially with weak growing kinds like Niphetos. He did not consider it desirable.

Mr. Tailby said that he has eight or ten Maréchal Niels on the Tailby stock, and James Cartwright has many of the Niphetos on the same stock, none of which have suffered. Maréchal Niel overgrows the stock and sometimes forms a bunch as large as a man's fist, like a pear on quince. Some cultivators have earthed up so as to get roots from the graft. If the bark of the stock were slit so as to allow it to expand, there would not be so much difference in the size of the stock and bud. He prefers to have all roses, including Maréchal Niel, budded. A budded plant is all on one stem. Perhaps if Tea roses were kept free from suckers they would do as well as budded plants; but he thought that he got better flowers from budded plants.

A young grafted plant would not flower sooner for having the top cut off, but would be much injured. The reason that the plant shown had not flowered was that the wood had not ripened. If

the base bud started he would not cut it down. It is desirable that what wood is made should be made early, so as to be well ripened. He would let the graft grow, and cut down next year, and would not shift the pot. Each grafted bud gives as good a plant as a cutting with twelve eyes.

James Comley said that he was astonished to hear Mr. Hovey say last week that all roses do better on their own roots than when grafted. He had tried two hundred and fifty kinds, and not one did better on its own roots. The two plants shown by Mr. Tailby illustrated the difference; the speaker said he would like to take them and cultivate them for eighteen months and see which would do best. The sap from the whole stock goes into the scion. In grafting he preferred not to tongue, because there is danger of bruising the stock or scion. The Bon Silene can be grown very fine on its own roots, but much better when grafted on Laure Davoust. The Tea roses are true perpetuals, and want to grow constantly; he had lost many by drying them off, but this winter he had watered constantly, and had more flowers than ever before. Tea roses will not make much growth on briers, but should have constant growers for stocks. The Manetti also is deciduous, and makes no roots in winter. Perhaps grafted roses do not give so many flowers as plants on their own roots, but they are better. Hybrid Perpetuals do best on Prince's stock, which is a seedling brier. Mr. Prince is one of the best English rose growers, and the seed from which he raised his stocks was gathered from selected roses. It is difficult to get Dog briers small enough to graft. Prince's stock is the best for pot plants. A plant of Sir Garnet Wolsley, fourteen months old, exhibited by the speaker, had not rooted from the graft. Plants grafted on Dog briers and potted deep did not root from the graft, and almost all the roots of the stock died out. The Manetti stock makes roots at the surface.

The Chairman said that Ellwanger & Barry insist on the importance of planting budded roses low in the ground, so as to cover the stock.

Mr. Comley said that roses planted deep grow yellow and begin to die in two or three years. The Manetti grows naturally in high and dry soils. He did not think that the brier suffers from heat in this country; he had seen tall standards on this stock, in England, in the hottest places, and in New York and Flushing he had seen them as fine as in England.

The Chairman agreed with Ellwanger & Barry, in regard to planting roses on brier stocks deep, but differed in regard to those on Manetti. He thought also that the heat of our summers injures the stems of standard roses. He had such a plant of Baron Prevost, the stem of which he protected with straw and it flourished well.

Mr. Comley said, that a few years ago, he visited all the best rose growers in England, and all said they got as good a plant from a graft in one year, as they could on its own roots in two. He thought grafted plants would produce twice as large roses as those on their own roots. He would let all the wood of a graft grow, and prune after it was mature. The base eyes will not start as long as the leader grows. He wants only one shoot the first year.

The Chairman had a large number of grafted plants, very much like the one shown by Mr. Tailby, which grew so vigorously that the base buds broke. He had five hundred Gen. Jacqueminots which broke at the base. He cut them off and got good shoots, but not as vigorous as he hoped for. He agreed with Mr. Comley that a single shoot is best, and intended to try to ripen one shoot.

Mr. Comley said that the new Hybrid Tea and Perpetual roses such as Madame Lacharme, Boule de Neige, and Coquette des Blanches, grow more than other varieties. He thought it was owing to the Tea blood. It is a great mistake to over-pot roses and force them into too rapid growth. He wanted ripe, hard wood, if there was but a foot of it. He had plants on the Carolina stock which grew very strong, but the flowers were small. He had seen Gen. Jacqueminots potted in eight-inch pots and watered from the hose, whether the plants had any leaves or not. Most of his plants remained out too late last fall, and froze too hard; sixty which he placed in the barn cellar flowered finely. The tops cannot be frozen without injuring the roots. Root action should commence before the buds start. He would never keep a house of Hybrid Perpetuals above 45° by night and 60° by day. You cannot expect good roses without firm wood. Many cultivators shift too often. He exhibited a shoot taken from a plant of Jean Liabaud, which had been in an eight-inch pot for three years. He has thirty-six varieties, almost all of which have grown too strong. He has seen roses without leaves in eight to twelve-inch pots, which were filled with water. No plant requires so much care as

Hybrid Perpetual roses; tropical plants will, comparatively speaking, take care of themselves, if they have plenty of water. Roses in five-inch pots require good drainage. He seldom uses compost, but plain loam; it is well to add a little ground bone. He thinks a solution af saltpetre, at the rate of a handful to six gallons of water, the best thing both for watering and syringing. When he came to this country, he brought eighty varieties of roses, of which Caroline de Sansal, Mrs. Elliot, and Anna de Diesbach, were among the best. He wanted to increase them and grafting was suggested. He prepared Manetti stocks and grafted them, and in eight weeks could cut beautiful roses, one or two from each plant. He put cuttings round six-inch pots in September, and placed them in a cold frame, and in three or four months the pots were full of roots. He grafted in spring, selecting good flowering wood for grafts. He has always loved roses, and they seem to grow for him.

Charles M. Hovey said there is no doubt that the Prince's stock is a good one—much better than the suckers which were formerly used, before seedlings were raised, and which root only from one side. Mr. Baines, an eminent English culturist, says the only object in budding roses is to increase them rapidly. In 1848 the speaker had 1400 varieties of roses on his catalogue. The Hybrid Perpetuals were then almost unknown. From 1844 to 1860 (sixteen consecutive years) he was awarded the first prize for the best thirty roses, and the plants were all on their own roots. He dug up last fall old plants that had borne a thousand flowers. In 1844 he called on M. Laffay, the great French rose grower of that day, who raised the first fine Hybrid Perpetual rose (La Reine), still one of the very best, and from that day to this he had never grafted a thousand roses. Moss roses are rarely grown except on their own roots. A year ago he visited William Paul, one of the great English rose growers, and saw a house a hundred feet long, with plants in fifteen-inch pots, some on Manetti and other stocks, and some on their own roots. They do very well budded, but are uncertain. In 1844 he imported La Reine and Princess Adelaide, from which he took scions and grafted into roots, and in May had plants with buds. In 1859 or '60 he had a gardener from England, who wanted to try budding roses, and he did, and soon got enough of such stock. He has never grafted any since, except a few new varieties to increase them more rapidly to get good

cuttings. He has plants of Gen. Jacqueminot on their own roots which make canes six feet high, and he believes that he can beat grafted roses with plants on their own roots.

When a young man he used to go round among the cultivators in New York, and saw great plants of the old Yellow Tea rose on their own roots, with from twenty to twenty-five buds each. He invited any one to come and see a Safrano rose on its own roots in one of his houses, which makes suckers eight or nine feet in length, and twice as large as a grafted one of Mr. Paul's. There are many ways of growing roses, which are good. Grafting is not the only way. The law of nature is that every plant does about as well on its own roots as in any way. There are exceptions, but the number is limited. He has forty varieties of Hybrid Perpetuals on their own roots, planted in beds last spring, which have made shoots six feet high. Exhibition roses in England are generally budded because the varieties are new and scarce. Propagating largely by cuttings of soft wood is an American system altogether.

Mr. Tailby said that ninety-nine per cent. of the exhibition roses in England are budded.

Mr. Comley said that when in England a few years ago he saw almost all the noted rose growers, and asked why they did not grow roses on their own roots, and the answer was that they did not want them.

Mr. Hovey agreed with Mr. Comley that a large proportion of the exhibition roses in England are from grafted plants, but he believed this was not because the growers think they can get better blooms from grafts, but because they can be propagated more rapidly in quantities for sale. In this country Ellwanger & Barry graft largely for the same reason. There is danger of losing a weak variety grafted on a strong stock if care is not taken to destroy the suckers, but with plants on their own roots this risk is avoided.

Mr. Tailby had never seen any exhibition roses on their own roots. Many large growers of roses in England have not a greenhouse. A nurseryman who grows a hundred thousand roses must propagate them by planting Manetti cuttings and budding them. He had himself four thousand cuttings in frames, which have callused finely, and which he would bud in September.

Mr. Comley thought that some individuals in England had

spent as much as £500 each to produce the best twelve roses for exhibition. There are men who cannot identify three varieties, who produce some of the best roses. The speaker said that when he pots roses he does not use the same compost for all. If Baroness Rothschild is potted in the same soil as Louis Van Houtte, the former will be coarse. Those who adhere to the old roses will not get premiums. In five years the speaker had imported one hundred and eighty varieties of roses.

It was voted to continue the discussion of the subject on the next Saturday, and also to consider the best method of conducting the meetings for discussion.

MEETING FOR DISCUSSION.

SATURDAY, March 27, 1880.

A meeting for discussion was holden at 11 o'clock, William C. Strong, Chairman of the Committee on Publication and Discussion presiding. The subject was Rose Culture, continued from last week, and also the Best Method of Conducting the Meetings for Discussion.

James Comley, who had the floor at the last meeting, was again called on. He thought it was folly to deny, as some have done, that there has been any improvement in roses for the last twenty years. He could select fifty new roses which he would not give for a thousand of those on the catalogues of thirty or forty years ago. He doubted whether there is a man today who cultivates 1,400 varieties of roses. In his opinion, there are very few old roses equal to the new. Gen. Jacqueminot is good in many respects, but it is not the rose to stand. There are few old roses that retain their popularity as this has done. Gen. Duc d'Aumale is better. John Hopper, which has been in cultivation for many years, is one of the best. The speaker said he sought for quality before anything else. There is a great difference in the habit and vigor of the different varieties. Many condemn a rose from one year's trial. Unless one watches and keeps the run of the new roses, he cannot speak of them with justice. He saw at Weegan

Brothers', in Jersey Heights, six houses full of Gen. Jacqueminots on their own roots, and when he asked why they did not cultivate other varieties, they replied that they knew nothing of any others, as grown for market. Mr. Comley thought he could produce as many Baroness Rothschilds as Gen. Jacqueminots, under the same conditions. Almost every Hybrid Perpetual rose produces its flowers singly. The Tea blood makes them flower more freely, but they require more care to ripen the wood. When at Bowood, he used to bud two thousand roses annually. Some men who have not grown roses five years are more successful than others who have been engaged in rose culture for twenty-five years, or more. Many have been unsuccessful, and want to know the reason of their failure. It is not so easy to grow roses as is supposed by some; they require more care than any other plant. He made a mistake himself by leaving some of his plants out too long. He thought there had been a very great improvement in all classes of plants in the last ten years, and William Paul, of England, and Van Houtte of Belgium, would say there have been more good roses originated in that time than ever before.

Mr. Comley concluded by reading the following lists of what he considered the best twelve and best fifty Hybrid Perpetual roses, and the best twelve and best thirty tender roses. Most of the Perpetuals had been tested out doors, and proved hardy, but how hardy he did not undertake to say.

Twelve Hybrid Perpetual roses.

Abel Carrière,
Alfred Colomb,
Baroness Rothschild,
Boule de Neige,
Duke of Edinburgh,
Gen. Duc d' Aumale,
Horace Vernet,
Jean Liabaud,
John Hopper,
Monseigneur Fournier,
Paul Neron,
Rev. J. B. M. Camm.

Fifty Hybrid Perpetuals, the above and

Beauty of Waltham,
Boïeldieu,
Captain Christy,
Charles Lefebvre,
Duchesse de Vallombrosa,
Dupuy Jamain,
Elie Morel,
Étienne Levet,
Fisher Holmes,
Gen. de Cissy,
Gen. Jacqueminot,
Henry Bennett,

Jean Soupert,
John Fraser,
John Keynes,
John Stuart Mill,
Lord Clyde,
Louis Van Houtte,
Mabel Morrison,
Mlle. Emilie Verdier,
Mme. Alfred de Rougemont,
Mme. Boll,
Mme. Eugénie Verdier,
Mme. Prosper Laugier,
Mme. Scipion Cochet,
Marie Baumann,
Marie Rady,
Marquise de Castellane,
May Quennel,
Mons. E. Y. Teas,
Oxonian,
Perfection de Lyon,
Prince Camille de Rohan,
Queen of Waltham,
Reynolds Hole,
Sir Garnet Wolseley,
Triomphe de France,
Victor Verdier.

Twelve Tender roses.

Alba Rosea,
Belle Lyonnaise,
Catherine Mermet,
Climbing Devoniensis,
Gloire de Dijon,
Mme. Talcot.
Maréchal Niél,
Marie Ducher,
Niphetos,
Perle de Lyon,
President,
Souvenir de Malmaison.

Thirty Tender roses, the above and

Anna Ollivier,
Bon Silene,
Comtesse Riza du Parc,
Isabella Sprunt,
Jean Pernet,
La Sylphide,
Letty Coles,
Louis Richard,
Mme. Celina Noirey,
Mme. de Tartas,
Mme. Lambard,
Mme. Willermoz,
Perle des Jardins,
Royal Tea,
Safrano,
Souvenir de Paul Neron,
Souvenir d' un Ami,
Triomphe de Rennes.

John B. Moore said that he had never been engaged very extensively in rose culture, and had only gone into the cultivation of the Hybrid Perpetuals within the last ten years. He had found them so superior to the old June roses that he had discarded the latter entirely. In a lot of seventy-five plants of Hybrid Perpetuals, there was no time during the season that he could not cut roses. He had now begun to throw aside some of the finest Hybrid Perpetuals of twenty years ago, because the newer kinds are so much

superior. The Caroline de Sansal, for instance, is of no accoun when compared with Baroness Rothschild. It will not stand like the Baroness, and though it looks very pretty early in the morning—there is no time when roses are so beautiful as at sunrise—it opens only semi-double. He cultivates Moss roses as well as Hybrid Perpetuals, but cares little for the Prairie roses, for they are destitute of odor, and their individual flowers will not bear examination, though they look very pretty when covering an arbor.

It has been recommended to make borders for roses, composed of one half sods and the other half manure, but no man can grow as good roses in such a border as in good soil twenty inches deep, with plenty of manure. You cannot give them too much manure. He has them on their own roots, on brier, and on Manetti, and without an exception they all do best on Manetti. Gen. Jacqueminot will do very well on its own roots. The Manetti stock is best adapted to a sandy soil like his, which would not be called a naturally good rose soil, a strong loam being preferred. Some kinds will make six feet of wood as quickly as others will make three or four. He would plant roses about three feet apart each way.

The most important point in cultivating roses in houses is to have good, ripe wood. He has succeeded with them, but cannot tell just how it is done. He exhibited a rose grafted on a dormant Manetti stock in the cellar last December, the stock not being established in the pot. In root-grafting apples and pears he used to tongue the stock and scion, which made them stay more firmly, and the liquid grafting-wax would harden and hold them ; but when he came to roses he found that, though he could tongue the stock, the scion was too pithy to allow of it. He therefore made a splice graft with a shoulder on the scion, and left a little square place at the top of the stock to fit into the shoulder, which made it much easier to tie than a plain splice. He thought that if one-half grew it would be as much as he could expect, and the stocks of those which failed would not be lost. He placed them in a disused cistern where it was warm, and about one-half grew. Scions from wood under cover, which had not been exposed to frost, grew much better than those just cut from the garden. Some of the varieties produced blooms, which sold for six dollars per dozen. He thought Captain Christy not quite hardy ; it has a good deal of Tea blood, and La France the same. Victor Verdier is good out-doors, but there are some superior. Marguerite de St. Amand should not

be left out of any list, but it is better for out-door culture than for forcing. Mrs. Laxton, judging from one bloom, is very beautiful. There are many new ones which will require to be tested. He does not see but the newer kinds are as hardy generally as the older.

Charles M. Hovey wished to speak of new roses and to correct an impression entertained by some that he had said that there had been no improvement in roses for many years. The reason he had not exhibited roses for the last five years was that he disliked the method of exhibiting them in boxes of moss, as now required by the rules of the Society at the Rose Show. Mr. Moore and Mr. Tailby both showed fine roses at the recent exhibition, and they were well displayed in glass vases instead of resting on a bed of moss, and were a credit to the Society. Exhibiting roses in boxes is one of the bad English systems, denounced by Dr. Lindley in the "Gardeners' Chronicle," as devoid of all taste, and introduced here where we should lead, and not follow such a barbarous abuse of the Queen of Flowers.

Mr. Hovey here read memoranda showing the large number of prizes for roses taken by him from 1843 to 1865, and especially claimed that he had taken the highest prize for sixteen consecutive years, which no other member of the Society had done, and this too in competition with the great rose growers of those days. He also exhibited the invoices of roses imported by him from Messrs. Vibert, Laffay, Verdier, and other eminent French culturists, from 1842 to 1858, including sixteen or eighteen hundred varieties, and said that many of the old roses are as good as many of the newer sorts.

Mr. Hovey read from the "Gardeners' Chronicle," Vol. XII, new series, page 55, the names of roses exhibited in England, to show that the prizes were taken by collections containing a large proportion of old varieties.

For more than thirty years he recorded in the Magazine of Horticulture the progress of rose culture and the improvement of varieties. The old Cabbage rose is still extensively cultivated in England. He would not follow the English in everything. Because the English raise their pinks and bouvardias in pots, that is no reason that we should do so when we can plant them in beds and raise them by the thousand. Pot culture is not the only culture of roses. Notwithstanding the skill of the many good English

gardeners around Boston, they cannot compete with the Yankee farmers in raising either roses or rose bushes. A farmer in New Hampshire raises the best roses, as well as the largest quantity, of any person in New England, and two old Pennsylvania farmers raised 200,000 rose bushes.

In England budded roses will stand, but here they do not do so well. Mr. Hovey quoted Mr. Parkman's opinion (Book of Roses, page 74), that in "nine cases out of ten, roses are best on their own roots," and showed a specimen of a rose five or six years old on its own roots, and a layer, which he said was but one year old, and was Nature's method of propagating roses; also the dead stock of a grafted rose to show the danger of suckers growing up and choking the graft, and a budded rose which he bought in London. Budding is the best plan if it is desired to propagate roses rapidly, and Mr. Comley and Mr. Moore are so far right, but the speaker had failed to see that all do best grafted. He had shown flowers of La Reine six inches in diameter from plants on their own roots, and he has a Solfaterre with a stem three inches in diameter and sixty feet long, and a very large Safrano,—both on their own roots. Grafting roses is a mere matter of fancy, but it is well to understand what they will do and what they will not do. It is the simplest thing to grow roses if they have a house to themselves and are not steamed up. There is nothing finer than such old Roses as Paul Perras and Chénédolé.

Mr. Moore, in answer to Mr. Hovey's quotation from Mr. Parkman, stated that Mr. Baker, the champion rose grower in England, would not have roses except on Manetti stocks. What Mr. Hovey had said about the old roses is true with regard to Teas, of which the old ones are good. There were probably many synonyms in Mr. Hovey's catalogue of 1400 names. Mr. Moore acknowledged that Mr. Hovey had done a great deal for horticulture, and desired to give him credit for it. In regard to the 200,000 roses propagated by the two Pennsylvania farmers, Mr. Moore said that they were cuttings of green wood which are a long time in getting sufficient strength to produce good flowers. A strong graft will produce a dozen flowers in a year, when the cuttings would not do it in three years.

Aaron D. Capen mentioned the two splice-grafted plants shown last week in five inch pots, and asked whether the cuttings grown in two inch pots would not have done as well as the grafts if they had been in as large pots.

Mr. Comley replied that they would not. If a cutting is taken off and planted at the same time that a graft is inserted, it will be three times as long in making a callus as the graft will be in uniting.

E. W. Buswell said that he had examined the roots of the cutting and they had not filled the small pot in which it was planted, and it would therefore be improper to give it a larger one.

The discussion of rose culture was concluded here, and the best method of conducting the meetings for discussions was taken up.

Leander Wetherell thought it should be a rule that no debater has a right to quote a private conversation in reply to public remarks. Another point is that all personalities or personal reflections should be avoided. The old and the new are essential to each other; we are today largely indebted to our ancestors for what they have done for us, and we have heard today good remarks both from the older and the younger members of the Society. The great defect in our discussions is the want of accurate and careful observation. There is more or less of jealousy in all professions. Our purpose should be to select men who understand the subjects of which they speak, and not men who come here to advertise their goods. A man who thoroughly understands his subject is always welcome. He believed that every skilful rose grower kept back something; he had found gardeners the hardest men to get secrets out of, and he commended them for it. He trusted the discussions would be conducted in such a way as to bring out practical knowledge, so far as cultivators feel at liberty to impart it.

John B. Moore thought we had not come up to the best method in conducting these meetings. It should be a rule that no one should speak more than ten minutes at a time, or more than once on the same subject without permission. In farmers' clubs, which he had attended, the first half-hour was occupied by two leaders who were appointed beforehand and were expected to prepare themselves to take different sides of the subject assigned. This gave a right direction to the discussion. Speakers should be held strictly to the subject before the meeting, and all personalities should be avoided.

William H. Hunt agreed with Mr. Moore that speakers should be held more strictly to the subject than they generally had been, if we wished to derive the greatest advantage from the meetings.

The Chairman remarked that questions of interest suggested by the exhibitions often sprang up during the meetings, which rendered

it difficult to confine the discussions closely to the subject assigned. The plan of opening the discussions by speakers appointed beforehand was excellent, but the Committee had found it extremely difficult to obtain speakers.

Mr. Moore replied that subjects came up in the same way in farmers' clubs, and that the proper way of meeting them was either to suspend the subject assigned or postpone the new one.

Mr. Wetherell thought that all speakers on side issues should be strictly ruled out of order.

Mr. Moore thought credit was due the Chairman for originating these discussions, when President of the Society, and for his constant efforts to sustain and improve them. He did not intend to cast any reflection on the Committee on Publication and Discussion, and did not believe the Society could select a better committee.

The meeting then adjourned *sine die*.

MISCELLANEOUS PAPERS.

The following papers, on Seedless Fruits, by Dr. E. L. Sturtevant, and a Calendar of the Flowering of Trees and Shrubs in 1880, by John Robinson, though not of a character for reading at the meetings of the Society, are deemed by the Committee of so much interest and value that they have much pleasure in adding them to the Transactions. Professor Robinson's Calendar is much fuller than any previous one, and he has encouraged the Committee to hope for a continuance of it in future years.

The Committee have also added a few letters which have been suggested by the discussions of 1879, and they would take this opportunity to acknowledge the obligations of the Society to the writers.

SEEDLESS FRUITS.

BY E. LEWIS STURTEVANT, M. D., SOUTH FRAMINGHAM, MASS.

Seeding is not an essential characteristic of individual plants, nor, under peculiar circumstances, even of whole groups of plants. We not only find in Nature productiveness varying among species, but often complete barrenness. Thus Brandis* states that the seeds of *Bambusa arundinacea*, Retz, and other species, have often saved the lives of thousands in times of scarcity, as in 1812 in Orissa; 1864 in Canara, and 1866 (probably *B. Tulda*, Roxb.) in Malda, while *B. Balcooa*, Roxb., he has never seen in flower. Humboldt† states that the *Guadua* in South America blossoms very rarely, and says that it is a very striking fact that some plants grow with the greatest vigor in certain localities without flowering, as is the case with the European olive trees introduced into America centuries ago and growing near Quito at elevations of about 9600 feet above the sea level. Bojer‡ states the same fact for the walnut, hazel-nut, and the fine olive trees of the Isle of France. The sugar cane, according to various observers, says Darwin,§ never bears seed in the West Indies, Malaga, India, Cochin-China, and

* Forest Flora, 566.

† Views of Nature, Bohn's ed., 335.

‡ Hortus Mauritianus, 1837, 201.

§ An. and Pl., II, 206, N.Y. Ed., 1868.

the Malay Archipelago. Fleischmann,* however, speaks of a West Indian cane bearing seeds, but these did not sprout. The sweet potato has never flowered in my garden in Massachusetts; it, however, is cultivated for its flowers, as well as for its root, in India,† but Mr. Fortune informed Darwin‡ that in China, so far as he had seen, it never yields seed. *Citrus aurantium*, Riss. et Poit., in Lower Bengal does not fruit at all, or does not bear freely. *Millingtonia hortensis*, L., seeds very rarely in North India, and the Indian *Populus alba*, L., does not often flower, according to Brandis.§ *Agave vivipera*, when grown in rich soil, invariably produces bulbs but no seeds, according to Dr. Royle.‖ *Dioscorea aculeata*, L.,¶ is said never to flower or fruit. Firminger** states that the quince had been in the Calcutta Botanic Garden for twenty years, and had never blossomed. Dr. Riddel states that the tree blossoms in some localities but does not produce fruit. Pear trees brought from America have blossomed abundantly every year, but nothing more, and apple trees, brought likewise from America, have blossomed often, but if they have set fruit, it has been only to drop it immediately afterwards. On the slopes of the mountains of Mexico, at Xalapa, says Humboldt,†† wheat does not form ears. Many alpine plants ascend mountains beyond the height at which they can produce seed. The *Acorus Calamus* extends over a large portion of the globe, but so rarely perfects its fruit that this has been seen by but few botanists. *Lysimachia Nummularia* so seldom produces seed-capsules, that Decaisne, who particularly studied this plant, has never seen it in fruit. The horseradish rarely perfects capsules.‡‡ Dr. E. Bornet, of Antibes, informed Darwin§§ that in hybrid *Cisti* the ovarium is frequently deformed, the ovules being in some cases quite absent, and in other cases incapable of fertilization. Darwin‖‖ also states that when stamens are converted into petals, the plant becomes on the male side sterile; when both stamens and pistils are thus changed the plant becomes completely barren. For this reason, double portu-

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* U. S. Pat. Of. Rept., 1848, 283.
† Firminger, Gardening in India, 511, 157.
‡ An. and Pl., II, 206.
§ Forest Flora, 53, 347, 474.
‖ Trans. Linn. Soc., XVII, 563.
¶ Seemann, Flora Vitiensis.
** Gard. in India, 245.
†† Travels, Bohn's ed., I, 498.
‡‡ For other instances see Darwin, An. and Pl., II, 207, 208.
§§ An. and Pl., I, 467.
‖‖ Ib., II, 204.

lacas have a great paucity of seed, and according to Breck * hardly a capsule of seed is to be found on a plant. In India, *Hibiscus Rosa-Sinensis*, according to Firminger,† is never known to produce seed, and this is also the case with *H. liliiflorus*.

Other instances of plants not producing seeds are to be found amongst the diœcious species when the two sexes borne on different plants are separated. Thus Theophrastus,‡ in the fourth century before Christ, observed that palm trees do not bear fruit unless the females are fecundated by the dust contained in the flowers of the male, and that in Greece the palm trees raised for the ornament of gardens bear no dates, or at least never bring them to perfect maturity. This process of fertilization, according to Stocks,§ is now performed in Sindh, in Arabia, and elsewhere, by making a hole in the sheath of the female flower, before the flower-sheaths open, and placing therein a few bits of the male panicle.

These illustrations seem to be sufficient to establish our proposition that seeding is not an essential characteristic of plants; that plants in nature and under art, *can* flourish, and yet, as a general thing, produce no seed, and hence it is *a priori* probable that the habit of producing seed can be changed, amended, or destroyed through the artificial processes involved in the act of domestication and cultivation.

Further, seed-bearing seems but a device for the propagation of plants, and in nature is so general a characteristic, because offering such a valuable provision for the action of natural selection in perpetuating the species. It is only when some other provision takes the place of this device of seeding, that a barren plant can exist as a species. Hence, in those cases where propagation is more readily effected in other ways than by seed, we observe a lessening of fertility, and an approach to or a complete barrenness. Perhaps we should add, although really included in the above, that the conditions of life affecting the new plant, may determine against the seedling and in favor of the bulb, the tuber, the runner, or the offset. The antithesis to natural selection is that useless parts have a tendency to disappear, and hence as the seed loses its importance, it is apt to lose its functions and identity. This fact is otherwise expressed by Goethe and Geoffrey St. Hilaire, viz, that when one part of a plant is unduly nourished, other parts

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* New Book of Flowers, 39.

† Gard. in India, 412.

‡ Hist. Plant., Lib. 2; Lib. 3, cap. 5.

§ Hooker's Jour. of Bot., VII, 551.

become reduced, and this is called the law of compensation or balancement of growth.

Thus, the potato ceases to produce seed-balls freely as the tubers become improved by cultivation, as is generally known, and is especially illustrated in the experience of the well-known propagator, C. E. Goodrich.* The Bogota potato, when first introduced, bore small tubers, and was covered with fruit; twenty years later it produced enormous tubers, but did not even set, much less perfect seed. Thomas Andrew Knight† says he has shown that the cause why early varieties of the potato do not afford blossoms, is the preternaturally early disposition of the plant to generate its tuberous roots. The varieties of radish, says De Candolle,‡ with small roots, yield numerous seeds valuable for containing oil, whilst the radishes with large roots are not productive in oil-bearing seeds. In one instance, I removed a young beet plant, a biennial, from a rich to a sterile soil, and subjected it to conditions interfering with its vigor, and the root grew to but small size, but a seed-bearing shoot was thrown up. In several instances by continually checking the growth of the cabbage by quite frequently pulling upon the small plant until I could feel the fibres of the root yield I produced rapid "heading," and the appearance of the seed-stalk the first year. The maize plant, under excessive manuring, I have found to grow with great luxuriance, and to be productive mostly of deformed ears of grain, and but a small crop. To make European vegetables under the hot climate of India yield seed, says Ingledew,§ it is necessary to check their growth, and when one-third grown, they are taken up, and their stems and tap-roots are cut or mutilated. Prof. Lecoq‖ had three luxuriant and sterile plants of *Mirabilis*, but after beating one with a stick until only a few branches were left, these at once yielded good seed. Seedling fuchsias, says Burbidge,¶ if starved, frequently flower when only an inch or two in height. M. J. Berkeley** says that those persons who undertake to supply good turnip seed, check the luxuriance of the roots by repeated transplanting, as it is found that seeds raised from the finest roots produce plants which have a tendency to make a luxuriant head rather than a large and sound root.

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* Trans. N. Y. Ag. Soc., 1848, 418.
† Hort. and Phys. Papers, 321.
‡ Mem. du Mus., VII, 178, quoted by Darwin, An. and Pl., II, 412.
§ Trans. of the Agri-Hort. Soc. of Ind., II, quoted by Darwin.
‖ De la Fécondation, 1862, 308, quoted by Darwin.
¶ Cultivated Plants, 91.
** Treas. of Bot., II, 1082.

Joseph Harris, of Rochester,* says "You can raise more plants from an ounce of *poor* cabbage, onion, lettuce, carrot, parsnip, and beet seed than you can from an ounce of the best and choicest," as there seems an antagonism between the functions of seed production and of growth. John Morrison† writes that there are numerous instances where turnips, when young, have received a check by frost, and run to flower instead of bulbing. The *Solandra grandiflora*, a Jamaica shrub, for years grew vigorously in English stoves, without showing any signs of fructification. By checking the luxuriance of the growth it is now caused to flower abundantly.‡ An analogous illustration is the surprise expressed by Koelreuter§ that sterile hybrids show a strong tendency to develop gigantic or tuberous roots, and almost invariably tend to increase largely by suckers, etc.

These are sufficient illustrations of antagonism of growth between root development and seeding, and leaf-growth and seeding. We will now pass to the antagonism that appears to exist between the development of the various parts of the fruit, confining ourselves to the species which are normally, or in varieties, or individually, seedless, and using the term fruit in the cultural, and not in the botanical sense.

The Apple, *Pirus malus*, L., is a fleshy fruit consisting of the ovary and calyx. The outer skin, or epicarp, is composed of the epidermis of the calyx combined with the ovary; the fleshy portion is the mesocarp, formed by the cellular portion of the calyx and ovary; while the scaly layer forming the walls of the seed-bearing cavities in the centre, is the endocarp. The carpels lie in the centre of the fruit, and form the core, while the edible pulp is formed by the calyx, which is adherent to the exterior of the ovary. The calyx is a modification of the leaf structure, or morphologically is related to the leaf.

The better varieties of the apple usually contain some abortive seeds, and are individually to be found seedless. As a rule, to which as yet I have noted no exceptions, the larger the apple the greater the number of abortive seeds. Thus five Baldwin apples,

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* Seed Catalogue for 1880, p. 1.

† Prize Essays Highland Soc., 4th Ser., II, 101.

‡ Quarterly Journal of Agriculture, I, 294.

§ Bastarderzegung, 5, 527, quoted by Darwin.

weighing thirty ounces, had eleven plump and nine abortive seeds; five other Baldwins from the same barrel and weighing seventeen ounces, furnished twenty-five plump and three abortive seeds. It also appears to be a fact that in general the improved varieties of apples contain fewer seeds and a larger proportion of abortive seeds than do wilding apples; and there is strong reason to suppose that apples of high quality, especially if ripening up soft, contain fewer plump seeds than do inferior varieties, but I have noted exceptions. Lunan* says that in Jamaica the fruit seldom contains seed, and no apple yet introduced thrives. The curious St. Valery apple in France, says Darwin,† although it bears fruit, rarely produces seed. At the Massachusetts Horticultural Society's Exhibition in 1834, a curious apple produced without blossom, and having neither core nor seed, was exhibited.‡ Mr. Knight§ grafted the apple upon a pear stock, and the fruit thus obtained had not a single seed. In a case reported in France of a seedling apple, one half of which was red and acid, the other half green and sweet, there was said to be scarcely ever a perfectly developed seed.‖ Individual apples are frequently seen with all the seeds abortive, and the Romans are said to have had one sort without kernels.¶ Yet in these instances of seedless fruit, we have but a hint of improvement in quality accompanying barrenness.

The Banana is a prominent instance of a seedless fruit. The fruit is composed of three adherent carpels, surrounded by the external coat of the ovarium. It belongs to the genus *Musa*, and is conveniently described as forming a number of species. This fruit, according to Humboldt,** has been constantly cultivated as far as history and tradition extend, in all continents within the tropical zone. As is well known, it rarely produces seeds. On the coast of Paria, however, near the Golfo Triste, the banana is said to occasionally produce germinating seeds if the fruit be allowed to ripen on the stem. At Bordones also, near Cumana, perfectly formed and matured seeds have been occasionally found in this fruit. In the Province of Cercado, on the Amazon, "there is an enormous amount of kinds or varieties of bananas which produce in the year from seed."†† It is doubtful whether this does not

* Hort. Jam., I, 24.
† An. and Pl., II, 203.
‡ Hist. Mass. Hort. Soc., 234.
§ Phys. and Hort. Papers, 222.
‖ Loudon's Gard. Mag., XIII, 230.
¶ Hort. Trans., I, 152.
** Views of Nature, 305.
†† Castelnau's Travels.

refer to the yield from the planting of suckers, however. Meyen* states that at Manilla one variety of the banana is full of seeds. Capt. Cook arrived at Batavia in December, 1770, and describes the bananas there. After mentioning several varieties he says "there is one which deserves the particular notice of the botanist, because, contrary to the nature of its tribe, it is full of seeds. . . . It has, however, no excellence to recommend it to the taste, but the Malays use it as a remedy for the flux."† Burton‡ says of Central Africa that the best fruit plantain is that grown by the Arabs at the Unyamyembe; it is still a poor specimen, coarse and insipid, stringy and full of seeds. . . . Upon the Tanganyika lake there is a variety called "Mikono t'hembro" or Elephant Hands, which is considerably larger than the Indian "Horse Plantain." The skin is of a brick-dust red, in places inclining to rusty brown; the pulp is a dull yellow, with black seeds, and the flavor is harsh, strong, and drug-like. Roxburgh § says the original wild *Musa* from which all the cultivated varieties of both plantain and banana proceed, bears numerous seeds. The fruit is soft and pulpy. In the Himalaya, Hooker‖ mentions two species that ripen austere and small fruits, which are full of seeds and quite uneatable. The fruit of *M. ensete*, Bruce, is not palatable and is rarely eaten, and contains a few large stony seeds. It is grown in large plantations, in Abyssinia, for the inner part of the stem and the young spike, which are served as a table vegetable.¶ *M. glauca*, Roxb., of Pegu, never produces suckers. The fruit contains little else than seeds, not fit for a monkey to eat.** *M. Nepalensis*, Royle, is found in Nepal, growing apparently in a wild state, and the fruit containing little else than the hard dry seeds.†† *M. superba*, Roxb., a native of Southern India, ripens seed which is fertile. The fruit is of no use; when ripe it is more like a dry capsule than a berry. It never produces suckers.‡‡

The seedless species are: *M. Arakanensis*. The fruit of this

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* Reise um Erde, II, 214, quoted by Darwin.

† Cook's Voyages, I, 304.

‡ Lake Regions of Central Africa, 316.

§ Coromandel Plants, plate 275.

‖ Himalayan Journals, I, 183.

¶ Unger, U. S. Pat. Of. Rept., 1859, 352. Masters, Treas. of Bot., II, 765.

** Roxburgh, Coromandel Plants, pl. 300.

†† Royle, Illust. of the Bot. of the Himalaya Mts., 355.

‡‡ Roxburgh, Coromandel Plants, III, 18, 96.

plantain is one of the best there is; the old trees yield particularly fine fruit. In 1857, eighteen varieties were sent to the Agri-Horticultural Society of India.* *M. Chinensis*, syn. *M. Cavendishii*, is a very rich and delicious fruit, now grown in Florida, and the variety best suited for greenhouse culture. *M. paradisiaca*, of the Siamese countries, has many varieties.† *M. rubra* is the "Vai" of Cook, and the "Fahie" of Wilkes. The fruit, which grows upright, is of a deep golden hue with orange-colored pulp, destitute of seeds, tasting like the common banana but of a higher flavor, and very popular with the natives of Tahiti.‡ "The Ram Kela," of India, has fruit of a very dark red, ripening to a yellowish red, remarkably fine.§ *M. Fei*, the "fei," a wild plantain of Tahiti, of which there are five varieties, is usually eaten either roasted or boiled.‖ *M. sapientum*, the species to which some botanists refer all the others as varieties, has many varieties. Firminger¶ describes seven in culture about Calcutta. Simmonds** says there are twenty varieties in Tenasserim, ten in Ceylon, and thirty in Burma. In Madagascar the plantains are about as large as a man's arm. The "Staff of Life" in Central Africa has about a dozen varieties. Burton†† says it is "scarcely ever eaten in the ripe state, save by the females who extract from it an unfermented and delicious liquor."‡‡ Grant §§ says it is the staple food of the countries one degree on either side of the equator. There are half a dozen varieties,—the boiling, baking, drying, fruit, and wine-making sorts. The dried fruit from Ujiji is like a Normandy pippin. At Tongataboo, Cook found fifteen different varieties,‖‖ and at Atooi, in February, 1778, at least five or six varieties.¶¶ Acosta*** says "there is a kind of small planes, white and very delicate, which in Hispaniola they call Dominiques. There are others which are stronger and bigger, and red of color." This seems to be the *M. maculata*, Jacq., and *M. regia*, Rumph. Humboldt says††† the *Musa* has as great a variety of fruit as our apple and pear trees. *M. troglodytarum*,

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* Firminger, Gard. in India, 181.
† Pickering, Chron. Hist. of Pl.; 277.
‡ Wilkes, U. S. Exp. Ex., II, 28.
§ Firminger, Gard. in India, 180.
‖ Voy. of the Novara, III, 263.
¶ Gard. in India, 177.
** Trop. Agr., 457.
†† Lake Regions of Central Africa, 316.
‡‡ Long, Cent. Africa, 126.
§§ Speke's Nile, 583.
‖‖ Cook's Voyages, II, 127.
¶¶ Ib., II, 246.
*** Natural and Moral Hist. of the East and West Indies, Eng. Trans., 270.
††† Travels, I, 49.

L., syn. *M. uranoscopus*, Rumph., of India and the Pacific Islands, has fruit, like *M. rubra*, on upright stalks, small, reddish or orange colored, and edible.*

These statements bear out Balfour's inference† that in the case of bananas and plantains, the non-development of seeds seems to lead to a larger growth, and a greater succulence of fruit, and we might add quality also.

The Barberry, *Berberis vulgaris*, has a stoneless variety called Vinetier Sans Noyau by the French, but the plant frequently produces berries with seeds, as Downing‡ observes. R. Thompson§ says this stoneless fruit often occurs on old plants, and a celebrated conserve is made from it at Rouen, France. I have occasionally found seedless fruits on hedge plants in Maine. This fruit is botanically a berry with a few seeds.

The Beech tree, *Fagus ferruginea*, Ait., I have never known to produce nuts with a kernel, in Framingham, Mass. It forms the sterile fruit often in great abundance. I am told, however, that in groves it sometimes perfects the nut.

The Bread-Fruit, *Artocarpus incisa*, L. fil. The edible portion is formed by the cohesion into a single mass, of the floral envelopes and ovaria of a large number of flowers, arranged on a central fleshy column or spike. It is nowhere met with growing wild, (?) and has been distributed from the Moluccas, by way of Celebes and New Guinea throughout all the islands of the Pacific Ocean, to Otaheiti. It is also naturalized in the Isle of France and tropical America,‖ and bears fruit in Ceylon and in Burma.¶ On a single Polynesian island twenty-four varieties are enumerated, as Darwin** writes. In Otaheiti, writes Lunan,†† they reckon eight varieties without seeds, and one variety with seeds is inferior to the others, and this sort is not good unless it is baked. The seeds are said by Wilkes‡‡ to be often abortive in Tahiti. The natives of the Pacific Islands possess, says De Candolle,§§ many varieties, notably

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* Mueller, Select Plants.
† Botany, p. 261.
‡ Fruits, ed. of 1866, 284.
§ Treas. of Bot., I, 136.
‖ Unger, U. S. Pat. Of. Rept., 1859. 315.
¶ Brandis, Forest Flora, 426.
** An. and Pl., II, 309.
†† Hort. Jam., I, 113.
‡‡ U. S. Exp. Ex., II, 50.
§§ Geog. Bot., 919.

those whose fruits are without seeds, which indicates a very ancient culture. M. Sonnerat, found in the Philippines, the bread-fruit wild, and bearing ripe seeds of a considerable size*. The plants are propagated by cuttings. They may also, says Williams,† be increased by suckers, which are produced abundantly in their native countries.

The Cherry, *Prunus*, sp. is formed by a change in the substance of the carpellary leaf. The internal surface of this becomes hardened into the stone (the endocarp), whilst the external (epicarp) remains as a thin cuticle or skin, and the pulp of the fruit (the mesocarp) is formed by the increase of the parenchyma or fleshy tissue of the leaf. Robert Manning, a skilled and accurate pomologist, informs me that the cultivated cherries have the seeds generally abortive. This is not always the case, however, as Prince's Duke was raised by Mr. Prince, of Long Island, from a seed of the Carnation,‡ and it is doubtless true that our principal varieties have originated from seeds of the cultivated kinds. Mr. Knight§ crossed the Morello and common cherry. From many thousand blossoms, five cherries were produced, and four of these did not contain seeds. The quality was excellent.

The Chestnut, *Castanea vesca*, L., does not readily and abundantly ripen its fruit in the immediate neighborhood of the sea, in Massachusetts, says Emerson.‖ Abortive nuts are very common in the burrs, and frequently in Framingham all the fruits on the tree are abortive. In the Chestnut, the abortion of some of the ovules seems to be an invariable and normal process.

The Cucumber, *Cucumis sativa*, L. The fruit consists of three carpels united together and forming one cell, but having the ovules arranged on three lines which pass up the sides.¶ Seedless cucumbers are mentioned by Loudon** as being grown purposely from unfertilized flowers on account of their more desirable quality. William Saunders, now superintendent of the garden and grounds of the Department of Agriculture, at Washington, tells me that

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* Foster's Obs., 179, note.

† Choice Stove and Greenhouse Plants, II, 109.

‡ Downing, Fruits, ed. 1860, 274.

§ Phys. and Hort. Papers, 277.

‖ Trees and Shrubs of Mass., ed. of 1846, p. 165.

¶ Carpenter, Veg. Phys., Bohn's ed., 411.

** Horticulturist, 495.

this is a well-known custom, and E. F. Bowditch, of Framingham, Mass., has grown this seedless fruit in his cucumber house. The melon, which I have largely grown, I have never known to be seedless, but it is a matter of common observation with me that the fruits of the highest flavor and excellence are apt to contain fewer seeds than others of the same variety but diminished quality.

The DATE, *Phœnix dactylifera*, L. The epicarp is the outer brownish skin, the pulpy matter is the mesocarp, and the paper-like lining is the endocarp covering the hard seed. The tree is diœcious, and the female tree is fertilized artificially. Nineteen-twentieths of the population of Fezzan live on dates during nine months of the year. More than fifty varieties are there known, according to J. Richardson.* At Mooltan, P. Edgeworth states that there is one date tree called "Bedana" which bears a stoneless fruit, and in former times it was considered a royal tree, and the fruit was reserved for the reigning sovereign.† In the deserts of North Africa, the date palm has yielded, as Vogel‡ states, thirty-eight varieties.

The DIOSPYROS genus which includes the persimmon has occasionally seedless varieties. Forsyth§ mentions a cultivated variety of *D. melanoxylon*, Roxb., as being without stones. E. J. Wickson, editor of the *Pacific Rural Press*, writes me that some Japan persimmons, *D. Kaki*, L. fil., bear seedless fruit the first year; the second year seeds appear. "I cut one last week," he says (February, 1880), "ten and three-quarters inches in circumference, without sign of seeds." In Japan there exist some fifty varieties, thirteen of which Henry Loomis‖ pronounces as constituting the leading sorts. Of these the "Yemon" has some specimens seedless, especially when the trees are young. The quality seems to be excellent—superior to many, but not equal to the "Gosho." The *Diospyros Virginiana*, L., (Persimmon) is, as William Saunders informs me, frequently seedless. Occasionally varieties are met with having fruit double the size of the ordinary kind. The best ripen soft and sweet and have a clear, thin, transparent skin without any

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* Jour. Lond. Hort. Soc., 1851, 46.

† Jour. of the Agri-Hort. Soc. of India, 1867, quoted by Firminger, Gard. in India, 173.

‡ Annals and Mag. of Nat. Hist., 1854, 460.

§ Highlands of Central India, 463.

‖ Scientific Farmer, June, 1879, 78.

rough taste, as Porcher* says. It is not, however, yet classed, among our cultivated fruits by the American Pomological Society. I. M. Pearson† says, "I have seen some of our native kinds without any seeds, of which the fruit was delicious."

The Fig, *Ficus Carica*, L., is an anthocarpous fruit, in which the axis, or the extremity of the peduncle, is hollowed, so as to bear numerous flowers, all of which are united in one mass to form the fruit. Dr. Presl‡ enumerates no less than forty varieties which are cultivated in Sicily. Dr. Robert Hogg § enumerates sixty-five varieties of figs. Even in the United States, one leading nursery firm offers twenty-five varieties in its list.‖ There are forty-two varieties enumerated in the London Horticultural Society's Catalogue,¶ and eighteen in the American Pomological Society's Catalogue of 1877. Many kinds of fig, says Brandis,** attain maturity with sterile seeds—that is, seeds in which the embryo has not been developed, and therefore fecundation is not an essential condition to the ripening of figs. The cultivated fig tree bears two sorts of fruit; in the spring early figs or "fiorones," and in the summer late figs which ripen in the autumn. In the "fiorones" male flowers are very rarely found, and the few which may be present cannot serve for fecundation, for they do not make their appearance until long after the female flowers, nor until the stigmates of the latter are dried and destroyed. Whether it be owing to this or some other cause, I have never yet, says Prof. Gasparrini, been able to find seeds with embryos in the "fiorones." The summer fruits on the contrary, have no male flowers, and yet a large proportion, I may say nearly all, of their ovaries become perfect—that is, furnished with embryos.†† It is for this reason Gasparrini is led to suppose that the embryo of the fig seed is developed without previous fecundation.

The Grape, *Vitis*, sp. is botanically a berry, an indehiscent fruit which is fleshy or pulpy throughout. The seeds nestle in pulp formed from the placentas. The berry is formed from the

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* Resources of the Southern Fields and Forests, 387.

† Trans. Ill. Hort. Soc., 1878, 87.

‡ John Hogg, Hooker's Journ. of Bot., I, 182.

§ Fruit Manual, 3d ed., p. 102.

‖ Ellwanger & Barry, Desc. Cat. of Fruits, 1880.

¶ Downing, Fruits, 1866, 290.

** Forest Flora, 419.

†† Ann. des. Sciences, Sec. 3, Tom. V, p. 306.

ovaries alone. The ancients claimed a method of producing seedless grapes, which is thus given in the "Travels of Anacharsis":* "To obtain grapes without stones, you must take a vine-shoot and cut it lightly in the part which is to be set in the ground; take out the pith from this part, unite the two sides separated by the incision, cover them with wet paper, and plant it in the earth. The experiment will succeed better if the lower part, thus prepared, be put in a sea-onion before it is planted. Other methods are known to produce the same effect." As erroneous as this advice may seem, yet in the present age, Firminger, in a communication to the Agri-Horticultural Society of India,† says that he was informed by R. Solano, of Shahabad, that by scooping out the pith of the Litchi, the result was, the stone of the fruit became much lessened and the pulp consequently more abundant, and considerably improved in flavor. He also stated that a like result was produced on the grape vine in Spain. Gen. J. Jenkins also communicated to Mr. Firminger the following method of preventing the formation of seeds in guavas; "Take a young tree, split it in the middle with a carving knife, about twelve or fifteen inches up; pick out the pith, close it, cover it with earth and bind it up with straw. The tree will grow as before, but the fruit will have no seeds in them." But the general had never tried it.

In the grapery of M. H. Simpson, Saxonville, Mass., is a seedless variety of the Black Hamburg, of which I have frequently eaten the fruit. Yet even this vine occasionally produces seeds in some of the berries. William Saunders informs me that seedless grapes frequently occur in the graperies of the Department of Agriculture at Washington, when from any circumstance the pollen becomes excluded from the pistils. The Sultana grape is always a seedless variety, and is so advertised in our nurserymen's catalogues. Arnold‡ says, "In the way of eating there can be few greater pleasures than to devour the grapes of Kasveen on a hot day as one would currants in England. They are the small, stoneless grapes, which, when dried, are sold as Sultana raisins." The Zante currant is a seedless grape, and supplies the dried currants of commerce. E. J. Wickson writes me that "the

* Theoph., De Caus. Plant., Lib. 5, Cap. 5; Democr., Geopon., Lib. 4, Cap. 7; Pallad., De Re Rustic., Febr., Tit. 29; Colum., De Arbor., 9; Plin., Lib. 17, Cap. 21, T. II, p. 74; Traité de la Vigne, T. I, 29, are the references.

† Gard. in India, 170.

‡ Through Persia by Caravan, 151.

Corinth grape is quite apt to bring seeds, much to the disgust of our people in California, who are trying to make Zante currants. The Corinth does the same in Australia." The Arabians "dry a small sort of grape called 'Kishmish,' which has no stone, but only soft and almost impalpable seeds."* Ludovico de Varthema, in 1503–8, describing Reame, a city of Arabia Felix, says: "Here also is found a kind of white grape, which has no seeds within, than which I never tasted better."† The white wine of Ispahan, says Redding,‡ is made from a small white grape called "Kismish," which has no pips, perhaps first brought from the island of that name, noted for fine fruit, near Gombron. Near Atrascan, says Pallas,§ there is a grape with mere traces of seeds, so small and lying so near the stalk that they are not perceived in eating the fruit. "In Bulkh," says J. Harlan,‖ "the sweetest and best wine grape is called 'Kishmish;' it is a black, seedless fruit, of an oval shape, about the size of a person's first thumb joint. It differs in flavor, size, and color, from the Cabul grape of the same name." Among the grapes of Cabul is the "Ungoor-i-Kishmishee," a fruit not large, round, transparent, with a slight tinge of yellow, seedless, sweet, and luscious. The grapes of Eschol¶ "have generally a transparent membraneous seed, though some are said to have actually no seed at all, whereby, while they are chewed, no seed is discoverable to the taste or tongue, yet it is apparent when the grape is cut with a knife and seed is sought for." Le Bruyer** describes similar grapes without seed in Persia. In the Punjaub, according to Firminger,†† they have an indigenous stoneless grape, called the "Bedana."

It cannot have failed to be observed how a diminution in the size of the seed accompanies an improvement in quality in our native grapes. In the cases given, all the seedless grapes seem to be described as possessing an excellent quality. Is this a complete instance of the antagonism between seed and quality of pulp, which we have before inferred?

The Guava, *Psidium guajava*, Raddi. In this fruit the seeds nestle in pulp formed apparently by the placentas. The savory

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* R. Niebuhr, Travels through Arabia.

† Travels, Hakl. Soc. ed., 77.

‡ Quoted in U. S. Pat. Of. Rept., 1860, 367.

§ Travels, Eng. Trans., I, 313.

‖ U. S. Pat. Of. Rept., 1861, 534, 529.

¶ Calmet, Dict. of the Bible.

** Quoted by Calmet.

†† Gard. in India, 212.

fruit, of the size of an apple, is highly relished, and is eaten raw or made into a conserve in the West Indies. It is covered with a rind of some thickness, within which are the seeds contained in a pulp without any shell.* The contained pulp is of white, red, or yellow color, in the varieties, full of bony seeds.† Its cultivation has been carried on by the primitive inhabitants of the main land of America, from Mexico to Brazil, from time immemorial, says Unger,‡ and it is frequently without seeds.

The KAKI. See Diospyros.

The MEDLAR. *Mespilus Germanica*, L. There is a variety called stoneless, without stones or seeds, advertised in French fruit catalogues.

The MULBERRY, *Morus alba* and *nigra*. The edible portion is formed by the cohesion, into a single mass, of the floral envelopes and ovaries of a large number of flowers, arranged on a central fleshy column or spike, the calyces becoming succulent, and investing the pericarps. This tree is but little cultivated in America, but in Asiatic countries it is in esteem. There are many varieties of *M. alba*, L., in Kashmere and Afghanistan, says Brandis,§ sweet and acid, and of all shades of color, from white to a deep blackish purple. The fruit furnishes a considerable portion of the food of the inhabitants in autumn, and much of it is dried and preserved. In Beloochistan, according to Stocks, there is a seedless variety called "Bedana." Harlan says,‖ the first fruit in the market at Cabul is the white, seedless mulberry or "Shah-toot," the thickness of the small finger. It is very sweet, and the tree is inexhaustibly prolific. In its season it forms the chief food of the poor. It is a grafted fruit. In Turkistan, the large white, almost seedless berries of the Khorasine mulberry from Khiva, both when fresh and dried, are greatly used for food.¶

The OPUNTIA *Davisii*, Engelm. Common on the upper Canadian, eastward and westward of Tucumcari Hills, near the *Llano Estacado*. All the fruit seen were sterile, and most of them elongated, one to one and a quarter inches long.**

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* Rhind, Veg. Kingdom.
† Lunan., Hort. Jam. I, 350.
‡ U. S. Pat. Of. Rep., 1859, 349.
§ Forest Flora, 407.
‖ U. S. Pat. Of. Rept., 1861, 529.
¶ Schuyler, Turkistan, I, 196.
** Engelman, Pac. R. R. Rept., IV, Bot. 49.

The Orange, *Citrus aurantium*, is botanically a hesperidium, or a berry with a leathery rind. This fruit consists of the carpels surrounded by the external coat of the ovarium, and having the space between their inner wall and the seeds they contain filled with a very succulent cellular tissue. The rind consists of epicarp and mesocarp, while the endocarp forms partitions in the interior filled with pulpy cells which are produced from the inner lining of the pericarp. The tree has been cultivated for its fruit from ancient times, and there are many varieties. According to Dr. Presl, there are fourteen cultivated in Sicily.* Loudon mentions nineteen varieties,† Downing twelve.‡ Gallesio describes forty of the principal kinds cultivated in Italy. Among the wild oranges of Florida even, I have noticed varieties. In one grove near Matanzas Inlet, I have found and eaten an orange with sweet pulp and bitter rind, and what is worthy of mention, the seeds are fewer and smaller in this variety than in the common bitter kind. D. J. Browne§ says that in many parts of the West Indies and South America, the wild oranges occur sweet and excellent, and sour and bitter, round, flattened, rough, smooth, obovate, pear-shaped, thick and thin skinned, juicy and dry,—some with and others without seeds,—some bearing seeds at the eye, outside of the fruit, while others present a navel-like protuberence at the same point, with no seeds. E. J. Wickson writes me from California: "I would state that the Navel or Bahia orange, now growing in this State is perfectly seedless." The St. Michael orange, says Browne,‖ one of the most delicious of all the varieties, is known by its small, seedless fruit, with a thin rind, and extremely sweet pulp. Loudon¶ says this variety "is generally without seed." Downing** says "the pulp often seedless, juicy, and often lusciously sweet." Dr. Bullar†† states that the thinness of the rind of a St. Michael orange, and its freedom from pips, depend on the age of the tree. The young trees, when in full vigor, bear fruit with a thick, pulpy rind, and abundance of seeds; but as the vigor of the plant declines, the peel becomes thinner, and the seeds gradually diminish in number, till they disappear altogether. "The myrtle-leaved orange," writes

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* Hogg, Hooker's Journ. of Bot., I, 106.
† Hort., 608.
‡ Fruits, ed. 1860, 691.
§ U. S. Pat. Of. Rept., 1858, 266.
‖ Trees of America, 59.
¶ Hort., 608.
** Fruits, 694.
†† Balfour's Bot., 280.

Darwin,* "in my father's greenhouse, during many years, . . rarely yielded any seed, but at last produced one; and a tree thus raised was identical with the parent." Gallesio† asserts that when he impregnated the flowers of the common orange with the pollen taken from undoubted varieties of the orange, monstrous fruits were produced, which included "little pulp, and had no seeds or imperfect seeds." A Japanese orange, "Mushin tani nashi mikaw," is said to be seedless, and the trees thornless.‡

The PEACH PALM, *Guilielma speciosa*, Mart. The "Piritou" or "Piri Jao" of the natives, writes Humboldt,§ are very extraordinary; every cluster contains from fifty to eighty; they are yellow like apples, grow purple in proportion as they ripen, two or three inches thick, and generally, from abortion, without a kernel. Among the eighty or ninety species of palm trees peculiar to the new continent, . . . there are none in which the sarcocarp is developed in a manner so extraordinary. The fruit furnishes a farinaceous substance, as yellow as the yolk of an egg, slightly saccharine, and extremely nutritious. We found it cultivated in abundance along the Atabapo and the Upper Orinoco. Bates‖ says the "Pupunha" grows wild nowhere on the Amazons, but has been cultivated from time immemorial by the Indians. Bunches of sterile or seedless fruit sometime occur at Ega and at Para. Seemann¶ says the "Pupunha" of the Amazon, the "Paripou" of Guiana, has in most instances fruit whose seed is abortive, the whole fruit being a farinaceous mass. Occasionally, however, fruits are found containing the perfect, stony seed, and they are then double the usual size. The tree is not found wild in the Amazon districts, but is invariably planted. This palm is propagated, says Williams,** both by suckers and from seeds.

The PEAR, *Pyrus communis*, L., is botanically a pome, a fleshy fruit with the calyx adherent, and forming along with the epicarp or skin, and the mesocarp or pulp, a thick cellular mass, which is eatable, while the endocarp is scaly or horny and forms separate cells enclosing the seeds. Its varieties are extremely numerous.

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* An. and Pl., I, 404.

† Teoria Della Riproduzeoni, 69, quoted by Darwin.

‡ South. Cal. Hort., June, 1878, 292.

§ Travels, II, 336.

‖ A Nat. on the Amazons, 268.

¶ Popular Hist. of Palms, 208.

** Choice Stove and Greenhouse Plants, II, 212.

In 1842 more than seven hundred had been proved in the London Horticultural Society's Garden to be distinct. The Romans cultivated thirty-six varieties in the time of Pliny.* In Tuscany, under the Medici, in a manuscript list by Micheli of the fruits served up in the course of the year at the table of the Grand Duke Cosmo III, is an enumeration of two hundred and nine different sorts, and another manuscript of that time raises the number to two hundred and thirty-two, as Targioni-Tozzetti says.† Robert Manning, deservedly an authority on pears, informs me there is a variety without seeds, called Sans Pepins; that certain varieties, such as Vicar of Winkfield and Beurre Diel, have most of the seeds abortive; and that second crop pears are invariably seedless. M. Plumadore, Raleigh, N. C., writes me under date of February 17, 1880, "To my surprise the pears were seedless, having nothing but a small stem-like thread clean through the pear. On my expressing surprise, they said the reason was that they were the third crop that year. I cut several open to see if all were alike and found them all the same. These pears would average two and a half inches in diameter, and about three or three and a half inches in length, but a few were larger." This was in the autumn of 1877.

From a rather careful observation, I am disposed to believe that the more luscious or buttery the pear, the more frequent the abortive seeds, and certainly our improved varieties have fewer plump seeds than the fruit from seedlings.

The Persimmon. See Diospyros.

The Pineapple, *Ananassa sativa*, is a well-known instance of a seedless fruit. This is a multiple fruit, only the ovaries or pericarps never ripen any seeds, but all are blended with the floral envelopes, the bracts, and the axis of the stem they thickly cover, into one fleshy and juicy mass. The pineapple is indigenous in South America, and is now naturalized in many parts of the East Indies, in Surinam, etc.‡ Afzelius says § it grows wild in Sierra Leone, and are cultivated by the natives. It grows in vast abundance about Calcutta. Firminger‖ describes ten varieties, but does not

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* M'Intosh, Book of the Garden.

† Jour. Lond. Hort. Soc., 1854, 159.

‡ M'Intosh, Book of the Garden.

§ Sabine., Hort. Trans., V, 461.

‖ Gard. in India, 174.

praise their flavor. A white kind which in the East Indies has run wild, is said by Unger* to still contain seeds in its fruit. Titford† says the pineapple grows wild in the woods of Jamacia. De Candolle ‡ says the pineapple sometimes has seeds, for Piso mentions positively a pineapple growing wild in Brazil bearing many seeds, and Humboldt found pineapples of delicious quality, growing wild on the Orinoco, and often the seeds were not abortive. J. H. White, of Florida,§ says "new varieties are produced from seed, but I have never seen a seed, and probably have never seen an apple that contained one. . . . A plant obtained from seed requires a long time to fruit — one writer says under favorable circumstances twelve years — and when it does fruit the chances are in favor of its being worthless." There are many varieties: in 1768, Taylor described five sorts; in 1737, Miller described five; in 1769, Speechly spoke of fourteen; in 1822, Nichol of ten; in 1831, George Lindley of thirty-seven; in 1834, Rogers of nine; Mr. Munro, a more recent writer, of fifty-two.‖ Mr. White¶ says one European catalogue gives the names of fifty, and it is said that fifty-two have been fruited at Chiswick, England. The fruit of all the varieties grown in Florida, he continues, is yellow; that of other sorts is said to be purple, scarlet, green, white, and black; it is mostly conical, sometimes globular, and differs in form, flavor, and consistency, weighing from two to fifteen pounds. In the wild state, Balfour** says the fruit is more or less acid, but when cultivated it becomes sweet and highly aromatic. Sir R. H. Schomburgk says, "We have met during our journeys in Guiana considerable extent of ground covered with pineapples; but in their wild state they are small, seldom larger than an apple, of a bright yellow; and though their smell is highly aromatic (surpassing in that regard the cultivated species) they are stringy, full of seeds, and rather acidulous in taste."††

The Pistacia. *Pistacia vera.* At Cabul, as J. Hanlan writes,‡‡ the pistacia yields a crop of fruit one year, followed always by a crop

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* U. S. Pat. Of. Rept., 1859, 331.
† Hort. Bot. Am., 54.
‡ Geog. Bot., 926.
§ Cal. Hort., 1880, 42.
‖ M'Intosh, Book of the Garden.
¶ Cal. Hort., 1880, 42.
** Bot. 545.
†† Rawleigh's Dis. of Guiana., Hak. Soc. ed., 74, note.
‡‡ U. S. Pat. Of. Rept., 1861, 533.

of blighted fruit. The latter is like the former in external appearance, but is somewhat larger and quite destitute of kernel.

The Plum, *Prunus Americana*, Marsh, is subject in New Brunswick to an anomalous form, which renders it seedless and inedible.* I have myself observed this appearance in Maine, the fruit becoming swollen, pulpless, seedless, and tasteless. Sometimes the remnant of an embryo is to be observed. This form seems more commonly to be produced when the spring season is cold and rainy. It is caused either by a fungus or the sting of an insect. The result is that the plum in this condition can hardly be called a fruit.† Darwin‡ refers to a form of the plum, *P. domesticus*, in which "the kernel lies in a roomy cavity surrounded only by the pulp" and called the stoneless plum. The varieties of *P. domesticus* are very numerous, some being bright yellow, green, almost white, blue, purple, or red. Downing describes one hundred and eighty sorts, and a leading nursery catalogue § offers a selection of one hundred and three kinds.

The Pomegranate, *Punica granatum*, L. A peculiar baccate, many-celled fruit, having a tough rind formed by the calyx, enclosing two rows of carpels placed above each other. The seeds are immersed in pulp, and are attached irregularly to the parietes, base, and centre. This pulp is apparently formed by the placentas.‖ On account of the profusion of its seeds, the pomegranate was with the ancients a mystical fruit, typifying procreation, increase, and abundance. It is found wild in Asia Minor, in Armenia, and in Central Caucasus, and Barnes found whole woods of it in Mazanderan.¶ In the Himalayas, it grows wild, and the fruit, though small, is offered for sale.** Barnes, in his "Travels in Bokhara," remarks on the pomegranate seeding in Mazanderan, as a remarkable peculiarity.†† Hasselquist‡‡ observed a variety in Cyprus with barren flowers, called "Balanistica." In India, the best fruits, having sweet juice and very small seeds, come from

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* Hooker's Journ. of Bot., III, 99.

† Dr. Harris in Hovey's Mag., VIII, 247; Dr. W. S. Farlow in New England Farmer.

‡ An. and Pl., I, 417.

§ Ellwanger & Barry, 1880.

‖ Balfour, Bot., 275, 262.

¶ De Candolle, Geog. Bot., 892.

** Royle, Illust. of the Bot. of the Him. Mts., 208.

†† Darwin, An. and Pl. II, 205.

‡‡ Voy. and Trav. in the Levant, 247.

Cabul.* Capt. Burton† describes three varieties which he met with in Arabia, one "Shamri" (Syrian), the best, a very sweet and superior fruit, almost stoneless, like those of Muscat, deliciously perfumed, and as large as an infant's head. The fruit is usually about as large as a full sized apple, having a hard rind of a yellowish color, and containing a pulp that is highly prized.‡ Sir A. Barnes mentions a "famous pomegranate without seeds, grown in gardens under the snowy hills near the Caubul River."§ "Seedless pomegranates from Djillabad" are enumerated among the fruits in the market of Cabul.‖ In 1860, cuttings of a seedless variety from Palestine, described as bearing fine fruit, much esteemed in Syria, were distributed from the U. S. Patent Office.¶

The Strawberry, *Fragaria*, sp. In this fruit the enlarged and conical receptacle bearing the pistils on its surface, becomes the edible portion in fruit. Of this esteemed fruit the varieties are endless. William Saunders informs me that he once had a bed of pistillate strawberries which fruited, but bore no seed, and that there were no other plants near from which fecundation could have been effected. A mule plant, says Thomas Andrew Knight,** from the Hautbois and Alpine strawberry, "blossoms very freely, and its blossoms set well; but the growth of the fruit subsequently remains very nearly stationary during the whole period in which the Hautbois strawberry grows and ripens, after which it swells and acquires maturity. It is then rich and high flavored, but of less size than the Hautbois, and without seeds."

In the above list, which we have extended somewhat to include the whole number of seedless fruits that we have collected, and wherein we have given such other information as will tend to show other conditions than the one of *antagonism* between the qualities of seedlessness and excellence of taste, we find either stated or inferred an improvement in quality accompanying seedlessness, or the lessening of seed-production, in the apple, the banana, the bread-fruit, the cherry, the cucumber, the date, the grape, the mulberry, the orange, the peach palm, the pear, the persimmon, the pine-

* Dutt., Hindoo Mat. Med., 166.
† Pilgrimage to El Medina and Meccah, I, 388.
‡ J. Smith, Dom. Bot., 368.
§ Firminger, Gard. in India, 260.
‖ J. Harlan, U. S. Pat. Of. Rept., 1861, 530.
¶ U. S. Pat. Of. Rept., 1860, 34.
** Phys. and Hort. Papers, 276.

apple, and the pomegranate. The exceptions appear to be the barberry, a fruit in but little esteem while raw; the beech nut, where seedlessness destroys its usefulness, as the seed is the part which is edible; the chestnut, wherein abortion destroys likewise the edible matter; the fig, concerning which as a seedless fruit we have collected few particulars; the guava, of which we have collected but little information; the medlar, of which we have found no reference to quality; the opuntia, a wild plant but little known; and the strawberry, of which we may say that it is probable that improvement in quality is accompanied by a proportionate lessening of the seeds. The pistacia, and plum, when seedless, appear to possess no quality whatsoever.

These fruits, using this term in a cultural sense, and excluding the edible seeds, are neither an essential to the plant nor to the seed. Like other unessential, yet generally present features, as the form of the floral envelopes, the coloring of the corolla, and the number of the leaves, the fruit is subject to a wide series of variations in size, color, and shape. It seems formed from the part of a plant peculiarly subject to modification, and apt to record the influence of external impressions; that portion of the plant which is of limited duration, and which must speedily fill its part. It is accessory to the seed only, and is concerned more with the province of the protection and distribution, than with the development. The apparent exceptions are the grape, guava, and the pomegranate, whose pulp seems formed of the placentas. The edible portion of most of these fruits consist of the pericarp, which is formed of three layers; the external, the epicarp, corresponding to the lower epidermis of the leaf and forming the skin to certain fruits; the middle, the mesocarp, representing the parenchyma of the leaf, and forming the pulpy portion of the apple, cherry, date, pear, etc.; and the internal, or endocarp, equivalent to the upper epidermis of the leaf, or the epithelium of the ovary,* and originating the edible portion of the orange and the banana. Yet if morphologically allied to the leaf, it has this important distinction,—the true leaf works for the plant; the fruit coverings of the seed work for themselves primarily, using the produce of the labor of the plant. Without the fruit the plant has a better growth as a plant, as is to be observed in numerous instances. Without the

* Balfour, Bot., 262.

great development of the fruit (Cultural fruit, I mean) the seeds are better nourished, as our examples of seedless fruits show, and also the fact that the wild species which have, so to speak, to look out for their own perpetuation, bear inferior fruits in size and flavor to those improved varieties we have released from the care of self-preservation.

Upon this view of the fruit, we can understand why we can so readily influence the character and the amount of the pulp of the fruit, as apart from the seed. The leaf builds up the plant; the fruit is royal; it uses the supplies furnished by the root and the leaf, and builds up itself. The root and the leaf are providers, the fruit is the regal consumer that adorns and expends through a more or less educated civilization. We can hence influence the fruit through an action on the providers, or we can increase the ambition of the user, or we can exercise our art upon root, leaf, and fruit. The first idea implies the furnishing of abundant fertility to the soil, and favoring culture and climatic conditions: the second idea implies the exercise of the art of selection: the third conveys the idea of intelligent domestication.

The rapid growing and sensitive condition of the parts concerned in the formation of the fruit, render it peculiarly subject to the sexual condition of the plant. An influence of the fertilization of the pistil, which is plainly recognized and quickly noted in the pistil, is not as readily apprehended upon the plant; yet, in some instances, and possibly, in very many, the influence of the pollen is noticed in a change of growth of the plant, as is also the influence of castration or the removal of the seed elements from influencing. This influence, which I have never seen noticed by authors, I am certain I have seen, but the results are too obscure to admit of detailed description, although in some cases plainly evident. They are best seen, and always seen, so far as I have examined, on rapid growing plants. As the pollination then has a strong influence, not only, as is well known, upon the formation of the seed, but also upon the seed coverings, and, as I have hinted, upon the plant considered as a whole, it is well to consider rather in detail, its influence upon the fruit.

Pollination is not fertilization, as the latter process consists of the union of the pollen material with the ovule; the former implies only the reception of the pollen by the stigma of the angiospermous plants. Pollination is not always productive of fertility, nor, on the

other hand, is sterility dependent upon the withholding of pollination or fertilization. Pollination acts upon the seed envelopes; fertilization may act upon the seed-envelopes, but does act upon the ovule. Fertilization is hence a sequence to pollination. Through the changes induced by the process of conscious, or unconscious domestication, we seem able to cause the pollination factor of the anther-product, to act in excess over the fertilizing factor, and hence produce results favorable to edible matter, and less favorable for the seed than would occur under wild conditions.

1. Pollination is not always productive of fertility. Gärtner* has shown by gradually increasing the number of pollen-grains until he succeeded in fertilizing a *Malva*, that many grains are expended in the development, or, as he expresses it, in the satiation of the pistil and ovarium. Again, when one plant is fertilized by a widely distinct species, it often happens that the ovarium is fully and quickly developed without any seeds being formed, or the coats of the seeds are developed without an embryo being produced within. Dr. Hildebrand† has shown that with several Orchidaceæ, the action of the plant's own pollen is necessary for the development of the ovarium, and that this development takes place not only long before the pollen tubes have reached the ovules, but even before the placentæ and ovules have been formed. Darwin‡ sums up by stating "we may admit that in most cases the swelling of the ovarium, . . . is at least aided, if not wholly caused, by the direct action of the pollen, independently of the intervention of the fertilized germ."

2. The access of pollen is not always necessary for fertility. Quatrefages§ says it is now unquestionable that certain plants can produce fertile seeds, although the flower has not been submitted to the action of pollen. Thus Spallanzani, Bernhardi, and Ch. Naudin affirm that female hemp can fructify without the participation of the male. Fresenius‖ says *Datisca cannabina*, female, fructifies very well without the concurrence of the male. M.

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* Beiträge zur Kenntniss du Befruchtung, 1844, 347–351, quoted by Darwin, An. and Pl. I, 483.

† Botanische Zeitung, No. 44, et. seq., Oct. 30, 1863; and 1865, s. 249, quoted by Darwin, ib.

‡ An. and Pl., I, 484.

§ Metamorphoses of Man, etc., Lond., 1864, 271.

‖ Linnæa, 1839.

Tenore* says the same for *Pistacia Narbonensis*, and Ch. Naudin for *Bryonia dioica*.† The same fact is also claimed to have been observed in *Cœlebogyne ilicifolia*, and a species of *Mercurialis*.‡

3. Nor is fertilization always necessary for fruiting. Thus Prof. Treviranus§ says "the circumstance which occurs in some plants (I will adduce only the banana and pineapple among Monocotyledons, and the hop and mulberry among Dicotyledons) that a perfect development of fruit, though with barren seeds, will take place without the process of fertilization, while in most others, under similar circumstances, no fruit is produced." Darwin‖ says "Again, it is well known that with many plants the ovarium may be fully developed, though pollen be wholly excluded, and . . . Mr. Smith . . . . . (as I hear through Dr. Hooker) observed the singular fact with an orchid, the *Bonatea speciosa*, the development of the ovarium could be effected by mechanical irritation of the stigma." Other illustrations may be selected from the statements given in our list of seedless fruits.

We are now prepared to discuss the causes productive of seedless fruits. We first note that (with the exception of the barberry, beech, chestnut, and opuntia) all of our list includes cultivated plants; second, that the majority have been cultivated from a remote antiquity; third, that all but one (and perhaps that) have furnished many varieties; fourth, that seedlessness has been an observed and desirable feature for most of them; fifth, that all can be readily propagated in other ways than from seed; sixth, that in no one instance is seedlessness always present; seventh, that improvement in quality is too often stated or inferred, to be considered accidental; eighth, that prolificacy in fruit is not incompatible with sterility in seed; ninth, that there is a tendency to decrease in size with seedlessness in some cases, and increase in others, and that probably those fruits whose edible portions are formed of placentas come in the first class, and the multiple fruits, and those whose pulp is the mesocarp in the second class; tenth, that the species are about equally divided between northern and southern climates.

We are next to note that neither pollination nor fertilization is

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* Ann. des. Sc. Nat., 4th ser., I, 328.

† Hooker's Journ. of Bot.,IX., 53.

‡ A. A. Black, Treas. of Bot., I, 309.

§ Jour. Lond. Hort. Soc., 1854, 112.

‖ An. and Pl. I, 483.

always essential to the formation of fruit; that the pollen may influence a development with sterility; that there is an antagonism of growth apparent between foliage and fruitfulness, and between pulp increase and seed maturation, and that cultivated plants are invariably and rigidly subject to the law of selection.

We are also to note that man usually works, even if unconsciously, upon the average, in the direction of his interests, or his satisfaction, and when a diminution in the size of seeds, and improved availability for use, once acquires recognition, there is a beginning of conscious selection.

It has often occurred to me that the influence of high culture upon the amelioration of fruits has been misunderstood. The effect of manuring is to cause increased growth of foliage and shoots, and it is often detrimental to the fruiting, as I have observed in my study upon the maize plant. The influence of cultivation is to check the growth of foliage and increase the fruiting tendencies of the maize plant upon over-rich soil. The effect of pruning, judiciously performed, is to improve the quality of fruit. In order, then, to ameliorate a wild species of fruit, one effort should be to stimulate the growth of the plant to the utmost, by furnishing favorable conditions of soil and fertility, and then to check rampant growth through the process of cultivation, and the art of pruning. In this way, for fruits formed of the mesocarp, we should expect to augment the tendency to increase of pulp, and a variation once obtained might be hoped to be perpetuated and increased through the process of seeding and continuous selection. As the pulp is improved, there is a dimunition in the relative size of the seed for the species, and the seed, as we have indicated in our list, has a tendency to become abortive.

It is quite probable that the continued amelioration of the pulp, which must occur sometimes amongst the vicissitudes of extended and long continued cultivation, is one important factor in the accounting for the seedlessness of some fruits, whether as a direct or more remote cause; especially of those fruits formed of the carpels.

In the multiple fruits, such as the breadfruit and the pineapple, we can understand how cultivation could produce a variation which would be recognized even by the savage, as desirable. Any cause which would diminish the energy of the pollen so that it would imperfectly fertilize, and be expended upon the ovaries without affect-

ing the ovule, and we have many instances of such a condition happening in cultivated plants (the apple of St. Valery, for one instance, and generally observed in hybridizing), and the softening of the core of these fruits, would probably be observed, for the general effect of seed-bearing is to harden the stalk, as for instance, the soft and flimsy cob of the unfertilized grain ear, and the hard, woody cob of the developed grain ear of the maize plant.

Hybridizing may be assigned as another cause whereby, although mules are oftener produced, an occasional seed may be found, and this seed, growing, might produce a seedless plant, which could be perpetuated and multiplied by offshoots, cuttings or grafts. Some of the statements given in our list would bear out this hypothesis.

Development without fecundation may also be assigned as an immediate cause, and this explanation derives additional force from the fact that the male element is apparently much oftener affected by changed conditions, at least in a visible manner, than the female element or ovule.* There would hence, under conditions of the cultivation of the fruit species named, be a tendency towards pollination in excess over fertilization, and selection would here come into play to intensify the differences once obtained, originating from this source. It is easy to believe, through the evidence given by the results of hybridism, that pollen may become unfitted to fertilize, and yet retain an influence upon the seed envelopes, the pericarp, and its modifications. This indeed, we believe to offer a sufficient explanation of the occurrence of many of our seedless fruits.

The influence of irritation in producing a development of the ovarium has been adverted to in the case of the orchid, *Bonatea speciosa*. Other instances can be given where the puncture of an insect produces the structure called galls. Thus, in Framingham, the common blueberry, *Vaccinium Pennsylvanicum*, Lam., occasionally bears a white fruit an inch or less in diameter, resembling a bladder with a fleshy rind, and tasteless; and the same form, but of irregular shape, is to be found in the place of the flowers and leaves, but I have never found any trace of insects within. In Zante, the apples or tumors of the sage, the effect of puncture of a species of cynips, are said by Sibthorp to be made into a conserve with honey. Galls are found on leaves, flowers, fruits, buds, and young bark, says Thomé, and they afford a striking illustra-

* Darwin, An. and Pl., II, 325.

tion of the influence of irritation upon structure. Placing a drop of oil in the eye of the fig, says Downing, causes the fruit to ripen much more certainly, and to swell to a larger size, and although oil can scarcely be considered an irritant substance, yet it seems to act such a part in this case. Whether this has any influence or not on the question of seedlessness, is worthy of future examination, but as yet, so far as we know, it must be considered only as a suggestion. As cucumbers are frequently seedless under glass culture, and as I have never seen them seedless under open-air culture, it is possible that exposure to the sun in the glass house has something to do with the development of the ovarium.

With this presentation we bring our paper to a close, not claiming as yet to have solved the problem, but desiring to call attention to the horticultural importance of this subject. It seems probable that in the future the most rapid horticultural advance is to be sought through the selection of seedlings from fruit containing the fewest and smallest seed of their kind, as unconsciously seems already to have been done in the improvement of the grape. Since writing this paper, I have collected a number of facts which lend publicity to this view.

Note.

The following quotations of additional seedless fruits were obtained too late for insertion in their proper places.

Lucuma *bifera*, Mol , of Chili, bears fruit twice a year. The one set, early in summer, has no kernels; the other set in autumn has two kernels.—*Molina*, *Hist. of Chili*, *I*, 129.

The Otaheite Apple, *Spondias dulcis*, which contains a hard capsule, commonly has no seeds in the loculaments or divisions.—*Foster's Obs.*, 179. Firminger was told that the seeds never germinate, but the varieties are propagated by grafting.

Lemon Citron.—The variety known as "Poncire" is always seedless. The Chinese Citron, the "Cedrat," of Florence, is sterile, or nearly so. The Large Orange Citron never contains seed.—*Gallesio*, *Treatise on the Citrus Family*.

The Læmon.—In South Africa, Thunberg (*Travels*, *II*, 141) met with a lemon which contained another within it, furnished with a

red rind. Neither of these two lemons had any seed. The Double Flowered lemon, says Gallesio, has no seeds. Other lemons sometimes contain no seeds. The Lime of Naples, the smallest of European lemons, is round, smooth, and very thin skinned, the skin odorous, the pulp abundant, its juice acid and agreeable because of its delicacy and aroma. This is one of the most highly esteemed lemons, adds Gallesio, and has no seeds.

Pumpkin.—When the *Cucurbita maxima*, *C. pepo*, and *C. moschata* were crossed, they yielded no seed, or only sterile seed.—*Darwin*, *An. and Pl.*, *I*, 430.

Pirus lanuginosa, DC., or Woolly-Leaved Service tree.—The flowers and fruit resemble those of the mountain ash, but are smaller; the flowers are frequently abortive, and the fruit, when it is produced, is generally without seeds.—*Loudon*, *Arb. II*, 924.

Tomato.—There is a seedless variety, fruits almost rose red, smooth and handsome, with few seeds. Very similar to, if not identical with, the "Perfected."—*Burr's Gard. Veg.*, 248.

DATE OF FLOWERING OF TREES AND SHRUBS, IN EASTERN MASSACHUSETTS, 1880.

BY JOHN ROBINSON, PROFESSOR OF BOTANY AND VEGETABLE PHYSIOLOGY TO THE SOCIETY, SALEM, MASS.

The following record of the time of flowering and fruiting of hardy, native and introduced trees and shrubs in the vicinity of Boston, Massachusetts, has been made chiefly at the Arnold Arboretum, West Roxbury; the Botanic Garden, Cambridge, and from trees and shrubs growing naturally in Essex County, during the year 1880. Unless otherwise mentioned the time of flowering is intended.

A few warm days in January sufficed to develop the flowers on the Red and White Maples; and the catkins on some of the Alders, Willows, and Poplars were quite conspicuous; but the season of

flowers can hardly be said to have commenced before the first of April:

March 20, Corylus Avellana.
Corylus Americana.
Alnus incana.
Alnus glutinosa.
April 4, Populus alba.
5, Populus tremuloides.
Acer rubrum.
Salix discolor.
6, Epigæa repens (for sale in Boston streets).
13, Salix viminalis.
14, Ulmus Americana.
Salix Caprea.
Salix acuminata.
Salix stipularis.
Salix Forbesiana.
Salix ferruginea.
Rhododendron chrysanthum.
Rhododendron Dahuricum.
Corylus rostrata.
Cornus mascula.
Shepherdia argentea.
Daphne Mezereum.
Erica carnea.
15, Salix humilis.
Ulmus campestris.
16, Andromeda Japonica.
Forsythia Fortunei.
Forsythia suspensa.
19, Larix Europæa.
Larix leptolepis.
21, Laurus Benzoin.
Andromeda floribunda.
Ulmus montana.
Salix sericea.
25, Populus grandidentata.
Populus balsamea, *var.* candicans.
Populus dilatata (Lombardy Poplar).

April 25, Myrica Gale.
Cassandra calyculata.
Dirca palustris.
Salix lividà, *var.* occidentalis.
Salix tristis.
27, Corema Conradii (at Plymouth, Mass).
Magnolia conspicua.
Larix Americana.
Acer platanoides.
28, Magnolia Soulangeana.
May 1, Prunus domestica.
Vinca minor.
Chamæcyparis sphæroidea.
Prunus Armeniaca.
Ribes rubrum.
Buxus sempervirens.
3, Prunus Persica.
Berberis repens.
Lonicera ciliata.
Erica carnea.
Ribes cereum.
Ribes aureum.
Spiræa Thunbergii.
Negundo aceroides.
Betula lutea.
Acer saccharinum.
Salix tenuifolia.
Salix cordata.
Salix triandra.
Salix purpurea.
Salix Andersoniana.
Abies balsamea.
Thuja occidentalis.
4, Ostrya Virginica.
Berberis Aquifolium.
Amelanchier Canadensis.
Amelanchier Canadensis, *var.* oblongifolia.
Salix alba.
Salix fragilis.
Magnolia Lenné.

May 4, Fraxinus excelsior.
6, Picea alba.
Vaccinium Pennsylvanicum.
Juniperus Virginiana.
Fraxinus Americana.
7, Pirus Malus, *var.* floribunda.
8, Fraxinus pubescens.
9, Daphne Cneorum.
Betula lenta.
Betula alba, *var.* populifolia.
Prunus Pennsylvanica.
Vaccinium corymbosum.
Arctostaphylos Uva-Ursi.
10, Salix Babylonica.
Spiræa prunifolia.
Spiræa oblongifolia.
Cercis Japonica.
Berberis Thunbergii.
Vaccinium corymbosum (tall form).
Sassafras officinale.
Celtis occidentalis.
Rhodotypos kerrioides.
Sambucus pubens.
Sambucus racemosa.
Celastrus Orixa.
Kerria Japonica.
Acer glabrum.
Acer polymorphum.
Rhus aromatica.
Xanthoxylum Americanum.
Cotoneaster vulgaris.
Amelanchier vulgaris.
Lonicera cærulea.
Ribes prostratum.
Prunus spinosa.
Pirus Japonica.
Betula nigra.
Betula papyracea.
11, Lonicera Tartarica.
Cornus florida (bracts opening).

May 11, Pirus baccata.
Pirus Malus.
Picea excelsa.
Rhododendron Rhodora (R. Canadensis).
Thuja (Biota) orientalis.
Fagus ferruginea.
Acer Pennsylvanicum.
Rhododendron (Cunningham's White).
Taxus baccata, *var.* Canadensis.
Syringa vulgaris.
Comptonia asplenifolia.
Ptelea trifoliata.
12, Juglans Sieboldii.
Cratægus coccinea.
Staphylea Bumalda.
Pirus arbutifolia.
Schizandra Sinensis.
Ribes floridum.
Prunus maritima.
Lonicera Ruprechtiana.
Andromeda polifolia.
Caragana microphylla.
Quercus dentata.
Pirus spectabilis.
Cornus Sibirica.
Spiræa lævigata.
13, Æsculus flava.
Æsculus Hippocastanum.
Chamæcyparis (Retinospora) pisifera.
Prunus Cerasus (Double).
Halesia tetraptera.
Cratægus tomentosa.
Quercus Robur.
Quercus rubra.
Quercus coccinea.
Lycium vulgare.
Juglans regia.
14, Rubus deliciosus.
15, Quercus tinctoria.
Picea nigra.

May 15, Pirus aucuparia.
16, Salix nigra.
Salix lucida.
Ribes oxyacanthoides.
Quercus ilicifolia.
Quercus bicolor.
Quercus alba.
Platanus occidentalis.
Vaccinium vacillans.
Wistaria Sinensis.
17, Carya alba.
Carya tomentosa.
Pinus pungens.
Æsculus flava, *var.* purpurea.
Lonicera Mariana.
Lonicera involucrata.
Acer cissifolium.
Xanthorhiza apiifolia.
Æsculus Hippocastanum (Double).
Acer spicatum.
Magnolia acuminata.
Acer circinatum.
Acer Pseudo-Platanus.
Pirus (Cydonia) vulgaris.
Salisburia adiantifolia.
Spiræa obovata *var.* hypericifolia.
19, Cryptomeria Japonica.
Pinus sylvestris.
Cratægus subvillosa.
Exorchorda grandiflora.
Leiophyllum buxifolium.
Cornus Sibirica.
Caragana arborescens.
Chamæcyparis (Retinospora) obtusa.
Rhamnus lanceolata.
Rosa acicularis.
Pterocarya fraxinifolia.
Morus alba.
Pinus inops.
Pinus Banksiana.

May 19, Acer Tartaricum, *var.* Ginnala.
Carya amara.
Ribes nigrum.
Ribes lacustre.
Ribes Grossularia.
Ribes rotundifolium.
Fothergilla alnifolia.
Vaccinium staminium.
20, Pæonia Moutan.
Prunus Virginiana.
Cornus florida (true flowers).
Berberis vulgaris.
21, Rhododendron (Azalea) nudiflorum.
Rhamnus cathartica.
24, Euonymus Americanus, *var.* obovatus.
Euonymus pulchellus.
Lonicera diversifolia.
Lonicera Maximowiczii.
Berberis Sibirica.
Berberis Canadensis.
Berberis Sinensis.
Berberis petiolaris.
Berberis dulcis.
Berberis vulgaris, *var.* purpurea.
Berberis emarginata.
Ptelea angustifolia.
Spiræa alba.
Spiræa betulæfolia.
Spiræa Fortunei, *var.* Van-Houttei.
Spiræa Amurensis.
Juglans cinerea.
Cotoneaster microphylla.
Morus rubra.
Morus nigra.
Syringa Persica.
Rhamnus infectoria.
Acer Tartaricum.
Viburnum Opulus.
Menziesia globularis.
Rosa alpina.

May 24, Rosa blanda.
Pinus rigida.
Gaylussacia resinosa.
Neviusia Alabamensis.
Cytisus purpureus.
Spiræa Reevesiana.
Smilax rotundifolia.
Calycanthus floridus.
25, Spiræa trilobata.
Viburnum plicatum.
Viburnum Lentago.
Cratægus Oxyacantha (Double and Single White and Pink).
Rosa rugosa.
Viburnum Opulus, *var.* (Snowball).
Rhododendron (Azalea) mollis.
Rhododendron (Azalea) Ponticum.
Rhododendron (Azalea) calendulaceum.
Pirus hybrida.
Deutzia gracilis.
Pinus Pumilio.
Pinus Laricio, *var.* Austriaca (Austrian Pine).
Pinus resinosa.
Laburnum vulgare.
Myrica cerifera.
27, Robinia Pseudacacia.
Chionanthus Virginica.
Diervilla (Weigela) rosea.
Ledum latifolium
Leucothoë Catesbæi.
Magnolia Fraseri.
Magnolia Umbrella.
Rosa pomifera.
Gaylussacia ursina.
Tamarix Gallica.
Lonicera caprifolia.
Cornus alternifolia.
Calycanthus glaucus.
Calycanthus lævigatus.
Rhododendron Catawbiense.

May 27, Berberis Fendleri.
28, Rubus villosus.
Rubus hispidus.
Pinus parviflora.
31, Rhus Toxicodendron.
June 2, Magnolia glauca.
Pinus Strobus.
Philadelphus hirsutus.
Viburnum acerifolium.
Colutea arborescens.
Nyssa multiflora.
Celastrus scandens.
Amorpha frutescens.
Philadelphus coronarius.
Cratægus pyracantha.
Gleditschia triacanthos.
Rhus cotinus.
Vitis Labrusca.
Rosa (garden varieties).
3, Philadelphus coronarius *var.* nanus.
Philadelphus grandiflorus.
Andromeda Mariana.
Robinia viscosa.
Buckleya distichophylla.
Rosa rubifolia.
Rosa spinosissima.
Rosa multiflora.
Aristolochia Sipho.
Cornus circinata.
Jamesia Americana.
Lonicera flava.
5, Hudsonia tomentosa.
Rosa cinnamomea.
Rosa pimpinifolia.
Rubus strigosus.
Pinus excelsa.
Lonicera sempervirens.
Lonicera Japonica.
Diervilla (Weigela, White and Dark Red varieties).
Syringa Josikæa.

June 5, Neillia opulifolia (Spiræa of gardens).
Vitis æstivalis.
Cornus paniculata.
Spiræa callosa.
Ptelea trifoliata.
Gymnocladus Canadensis.
Phellodendron Amurense.
Clematis fusca.
Spiræa salicifolia.
Potentilla fruticosa.
Celastrus paniculata.
Kalmia latifolia.
Ilex lævigata.
Cytisus nigricans.
10, Sambucus Canadensis.
Liriodendron Tulipifera.
Rubus occidentalis.
Tamarix Sinensis (first flowers).
14, Magnolia glauca (at Gloucester).
Styrax Japonica.
Ligustrum vulgare.
16, Wistaria frutescens.
Viburnum dentatum.
Genista tinctoria.
Rosa lucida.
17, Rubus odoratus.
Rubus Canadensis.
18, Rhododendron punctatum.
Andromeda speciosa.
Philadelphus Gordonianus.
Philadelphus inodorus, *var.* grandiflorus.
Rhododendron (Azalea) viscosum.
Tilia Europæa.
Halomodendron argenteum.
Calophaca Wolgarica.
Solanum Dulcamara.
Kalmia angustifolia.
19, Rhus venenata.
Cornus circinata.
Cornus paniculata.

June 19, Mitchella repens.
Linnæa borealis.
Rhus typhina.
23, Euonymus Europæus.
Gaylussacia frondosa.
Ailanthus glandulosus.
26, Ceanothus Americanus.
Cornus sericea.
Andromeda ligustrina.
Amelanchier Canadensis (fruit).
Vaccinium Pennsylvanicum (fruit).
Vaccinium corymbosum (small form, fruit).
Castanea vulgaris, *var.* Americana.
28, Rhododendron maximum.
Rosa rubiginosa.
Rosa lucida.
July 2, Spiræa Douglasii.
Ligustrum lucidum, *var.* ovalifolium.
Genista Sibirica.
Rosa setigera.
Ligustrum Japonicum.
Morus alba (fruit).
Morus nigra (fruit in market).
Catalpa Kæmpferi.
3, Koelreuteria paniculata.
Tilia Americana.
Hypericum Kalmianum.
4, Rosa Carolina.
Rubus occidentalis (fruit).
Catalpa bignonioides.
Chimaphila umbellata.
8, Ribes rubrum (fruit in market).
Hydrangea radiata.
Hydrangea arborescens.
Buddlea curvifolia.
Spiræa sorbifolia.
Spiræa Nobleana.
Spiræa Fortunei.
Castanea pumila.
Cephalanthus occidentalis.

July 12, Æsculus parviflora.
Erica tetralix.
Amorpha canescens.
Symphoricarpus racemosus.
Clematis Flammula.
20, Ampelopsis quinquefolia.
Rhus glabra.
Menziesia polifolia.
Menziesia polifolia *var.* alba.
28, Clematis campaniflora.
Clematis graveolens.
29, Clethra acuminata.
Lespedeza bicolor.
Aralia Japonica.
30, Rhus copallina.
Clematis Virginiana.
Ampelopsis tricuspidata (Veitchii of gardens).
August 3, Clematis paniculata.
Clematis ligusticifolia.
Clematis purpurea.
Clematis Pitcheri.
Euonymus pulchellus (fruit).
Ribes floridum (fruit).
Ribes nigrum (fruit).
Ribes Cynosbati (fruit).
Rhus semialata (R. Osbeckii).
Calluna vulgaris.
Clethra alnifolia.
9, Hibiscus Syriacus.
Tamarix Chinensis (full flower).
20, Prunus Persica (fruit).
Euonymus Sieboldianus.
Sept. 4, Berberis Fortunei.
Prunus maritima (fruit).
7, Quercus rubra (fruit).
Æsculus flava *var.* purpurea (fruit).
10, Æsculus Hippocastanum (fruit).
20, Quercus (fruit of all species falling).
Tilia Europæa (fruit falling).
Aralia Japonica (fruit).

Sept. 20, Æsculus parviflora (fruit).
23, Hamamelis Virginiana (fruit and flowers).
Gaultheria procumbens (fruit).
Mitchella repens (fruit).
Viburnum acerifolium (fruit).
Sophora Japonica.
Quercus Cerris (fruit).
Lespedeza (Campylotrypus) Sinensis.
Artemisia filifolia.
Celtis occidentalis (fruit).
Cornus florida (fruit).
25, Æsculus glabra (fruit).
Castanea vulgaris *var.* Americana (fruit).
30, Erica vagans.
Berberis vulgaris (fruit).
Berberis dulcis (fruit).
Berberis Sinensis (fruit).
Fraxinus Americana (fruit falling).
Magnolia acuminata (fruit falling).
Oct. 2, Berberis Canadensis (fruit).
Berberis emarginata (fruit).

CORRESPONDENCE.

FEDERAL POINT, FLORIDA,
November 4, 1879.

ROBERT MANNING,

Secretary Massachusetts Horticultural Society:

Dear Sir,—I have received and read with pleasure, Part I of the TRANSACTIONS of the Massachusetts Horticultural Society for 1879. On pages 23 and 32, allusion is made to a newspaper report about the deterioration of sweet oranges in Florida when grafted on the wild stock. The statement was probably circulated by persons who had ungrafted trees for sale, raised from sweet seeds. The most intelligent and progressive cultivators here constantly practice budding the choicest sorts on the wild stock with no fears of deterioration. In the orange districts of Europe, where this method of propagation has prevailed for many generations, the general testimony is that the oldest budded trees produce the sweetest and best fruit, although it is smaller in size than that of younger trees. The poor quality of the fruit upon old grafted trees, mentioned by Mr. Merriam, must have been owing to neglect or disease. If a neglected or scrubby tree be taken in hand and given generous culture, the fruit will immediately become so vastly improved in size and flavor that it could not be recognized as the same variety. Neither is the Indian River orange so peculiar and distinct as Mr. Merriam imagines. Its fine quality is partially owing to the congeniality of the soil and climate of that section. When Dr. Turnbull brought over his Minorcan colony in the last century, he also introduced a superior orange, which has since been largely propagated along the coast under the name of the Turnbull orange; but very many of the Indian River trees were budded from groves on the St. John's, and their product ranks with the best. Budding on the wild orange *does* offer the temptation of earlier returns, but not of greater hardiness, as Mr. Merriam states. The sour budded with the sweet is more likely to be injured during severe weather than an ungrafted sweet seedling, and some experienced growers profess to believe

that the sweet tree will endure a very little lower temperature than the sour. In Florida there are in circulation many erroneous and absurd opinions respecting orange culture as well as other things, and it is singular how many of these absurdities are accepted by visitors here, and detailed elsewhere as gospel truths. The sour orange grows faster while young than the sweet, and comes into bearing two or three years sooner, but the sweet finally overtakes it and makes the largest tree. Which of the two is the longest lived, it is impossible to say, as no one ever saw an orange tree die of old age in Florida.

Mr. Merriam also alludes, on page 96, to a rust on the orange which he considers of fungoid origin. Although he has never seen it elsewhere than in Florida, the New York dealers complain of receiving fruit from the West Indies and other places, similarly affected. The cause and nature of this rust has not as yet been satisfactorily determined. During the present season it has been made an especial object of study by microscopists, and, from the presence of minute insects, has been conjectured to result from the overflowing and hardening of the oil from cells ruptured by these insects. On the other hand it may be a deposit like honey-dew, more or less abundant as the influence of seasons, cultivation, or atmospheric conditions favors its precipitation.

As touching the influence of graft upon stock, I may observe that wherever I have worked stocks of the sour orange with the lemon, which latter is of more rapid growth, the stocks increased in thickness very much faster than when grafted with the sweet orange. I have also worked the sweet orange upon the lime and lemon, but cannot yet state whether the oranges produced differ materially from those on their own stocks.

A dozen years ago I procured grafts of the Lombard, Washington, and Imperial Gage plums, which were set on our common Chicasaw species. The union was perfect, and the trees grew vigorously, but in our climate became evergreens and bore but little fruit. This fruit resembled the gage plums in external appearance, but in texture and flavor inclined towards the Chickasaw. However, being unproductive, I was not satisfied, and so dug them up and threw them away.

Yours truly,

EDMUND H. HART.

W. S. Hart, of New Smyrna, Florida, writes: "I was much interested in the discussion on the Influence of the Stock upon the Graft. In it I see some wrong statements as to our oranges deteriorating when the sweet is budded on the sour stock. That is a great mistake, as I will try to prove to you at some future day."

The following letter from G. F. B. Leighton, a Corresponding Member of the Society, was suggested by the remarks on page 94 of the TRANSACTIONS for 1879, Part I, in regard to the duration of apple orchards:

NORFOLK, VA., SEPTEMBER 30th, 1879.

To the Massachusetts Horticultural Society:

Gentlemen, — A description of an apple orchard planted in Alfred, York County, Maine, in 1804, may be of interest to some of your orchardists. This orchard was planted by Daniel Holmes, a native of Kingston, Mass., in 1804, and consisted of about three hundred trees, all grafted fruit, the Baldwin, Roxbury Russet, and Rhode Island Greening taking the lead, with some Golden Russet, Pearmain Russet, Crawford, and five or six other kinds, the names of which have escaped my memory, but all choice varieties.

This orchard is upon a rocky hillside, facing the east, and in 1825 was regarded as the finest orchard in Maine. Last year there were remaining about two hundred and fifteen trees, which yielded two hundred bushels of apples.

Most respectfully,

G. F. B. LEIGHTON.

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A HISTORY

OF

AMERICAN HORTICULTURE.

The attention of Trustees and Librarians of Public Libraries, and of Horticulturists generally, is called to the History of the Massachusetts Horticultural Society, for fifty years, from its foundation in 1829. This work will be found of general interest, as the introduction comprises a sketch much fuller than exists elsewhere, of the History of Horticulture in the United States, from the settlement of the country to the foundation of the Society, and the history of the Society onward is, in the language of President Hovey, in his address at the dedication of the present Hall of the Society, "the History of Horticulture in our country." It is handsomely printed, on an extra quality of paper, and embellished with a fine steel engraving of Gen. H. A. S. Dearborn, the first president, and heliotypes of the two Halls erected by the Society. Among other interesting matters, it contains an account of the foundation by the Society, of Mount Auburn Cemetery, the parent of all similar cemeteries in the country.

The work is furnished to members of the Society at cost, $2.50, and to others than members for $3, but will be supplied to public libraries and booksellers at the same price as to members. Please address the Secretary of the Society, at Horticultural Hall, Boston.

ROBERT MANNING,

Secretary.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1880.

PART II.

BOSTON:
PRINTED FOR THE SOCIETY.
1881.

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Massachusetts Horticultural Society,

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TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, April 3, 1880.

A duly notified stated meeting was holden at 11 o'clock, Vice-President John B. Moore in the chair.

C. H. B. Breck, from the Executive Committee, reported a recommendation that the Society appropriate $250 for the expenses of the Committee of Arrangements. The appropriation was unanimously voted.

Miss SALOME H. SNOW, of Brunswick, Maine,
having been recommended by the Executive Committee, was, on ballot, duly elected a Life Member of the Society.

Adjourned to Saturday, May 1.

BUSINESS MEETING.

SATURDAY, May 1, 1880.

An adjourned meeting of the Society was holden at 11 o'clock, President Hayes in the chair.

Edwin A. Hall announced the decease of Jesse Haley, of Cambridgeport, and moved the appointment of a committee to

prepare memorial resolutions. The motion was carried, and the chair appointed as that Committee, Charles M. Hovey, Benjamin G. Smith, and Edwin A. Hall.

Adjourned to Saturday, June 5.

BUSINESS MEETING.

SATURDAY, June 5, 1880.

An adjourned meeting of the Society was holden at 11 o'clock, President Hayes in the chair.

The following vote, offered by C. O. WHITMORE, was unanimously passed:

Voted, That the Finance Committee, on behalf of the Society, request our President, the Hon. Francis B. Hayes, to sit for his portrait to be placed in the Society's rooms, and that the Treasurer is hereby authorized to pay for the same on approval of said Committee.

Benjamin G. Smith, from the Committee appointed at the last meeting to prepare resolutions in memory of Jesse Haley, presented the following, which were unanimously passed:

Whereas, The Society has learned of the decease of one of its members, Jesse Haley, of Cambridgeport, who died March 16, 1880, at the ripe age of seventy-three years and nine months;

Resolved, That the Massachusetts Horticultural Society would reverently recognize the wise though mysterious providence by which it has been so recently deprived of one of its active members, who always manifested much interest in the exhibitions of the Society, by contributing choice varieties of pears, to the production of which the latter part of his life was devoted, and whose orchards now show his great care in the cultivation of that fruit.

In his death, not only this Society, but the community, in many of its interests, has lost a most estimable friend, and a highly respected citizen.

Resolved, That the members of this Society tender to his family their sympathy in this their sad bereavement.

Resolved, That this notice of the death of Mr. Haley, be placed upon the records of the Society, and that a copy be sent to his family.

Adjourned to Saturday, June 12, at 12 o'clock.

BUSINESS MEETING.

SATURDAY, June 12, 1880.

An adjourned meeting of the Society was holden at 12 o'clock, President Hayes in the chair.

The following named persons having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society :

CHARLES W. KENNARD, of Boston.
STEPHEN C. CHASE, of Tewksbury.
THOMAS PRINCE, of Boston.

The meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, JULY 3, 1880.

A duly notified stated meeting was holden at 11 o'clock, Vice-President John B. Moore in the chair.

ALBERT M. DAVENPORT, of Watertown,
having been recommended by the Executive Committee, was, on ballot, duly elected a member of the Society.

Adjourned to Saturday, August 7.

BUSINESS MEETING.

SATURDAY, August 7, 1880.

An adjourned meeting of the Society was holden at 11 o'clock, President Hayes in the chair.

Marshall P. Wilder, who was present at a business meeting for the first time since the severe accident which he met with nearly a year and a half ago, said that he came under a sense of duty, though a sad duty, to pay a tribute to the memory of one of the oldest and most esteemed Corresponding Members of the Society, Robert Buist, of Philadelphia. It had been his privilege to be acquainted with Mr. Buist for nearly half a century. He was interested in all that pertains to the welfare of the human race. For a long course of years he stood at the head of our florists and seedsmen in the introduction and dissemination of new and valuable productions. Many of the most distinguished collections in our land can trace their beginning and much of their excellence to his enterprise and good taste. It was through him that the *Poinsettia pulcherrima* and the *Verbena Tweediana* (the latter the type of the numerous varieties which ornament our gardens), and a host of other now popular plants were introduced. His interest in fruit culture was shown by the fact that he was for many years Vice-President for Pennsylvania of the American Pomological Society. In all his dealings he sustained a character for honor and fairness. But he has done more than to raise fine trees or plants; he has trained up and sent forth, throughout the land, more young men to be an honor to horticulture than any other person in the profession. Nor should mention be omitted of the Christian character of Mr. Buist, who always closed his grounds on the Sabbath, and attended the worship of the sanctuary.

Mr. Wilder closed by presenting the following resolutions:

Whereas, Information has been received of the decease of Robert Buist, one of our oldest and most esteemed Corresponding Members, therefore, be it

Resolved, That in the death of Mr. Buist, the Massachusetts Horticultural Society has lost one of its oldest and most esteemed members, and our country one of its most enterprising, useful, and time-honored standard-bearers in horticulture; one, who by his eminent services in rural culture, and his love of the beautiful in nature, has done much to improve the taste and promote the prosperity and happiness of the American people.

Resolved, That while we deplore the loss of Mr. Buist, we rejoice that his example will still live; that his works will still speak to us, and that his influence in promoting rural art and rural taste will continue to bless those who survive him.

Resolved, That we sympathize with his family in this bereavement; that these proceedings be entered on our records, and that a copy of the same be sent to the family of the deceased.

William C. Strong seconded the resolutions, expressing the pleasure of the meeting that Colonel Wilder was able to attend and present them; and added, that it was enough to say of Mr. Buist that he was a worthy associate of Colonel Wilder. Not only his worldly interests, but his affections, were engaged in his profession.

Robert Manning spoke of Mr. Buist as a connecting link between the horticulturists of this and earlier generations, Hibbert and Buist having, in 1830, purchased the grounds of Bernard M'Mahon, who published the "American Gardener's Calendar" in 1806. He also spoke of the integrity and uprightness of Mr. Buist's character.

President Hayes added his tribute to the memory of Mr. Buist. His reputation as a horticulturist was as wide as the country, and the gardens throughout the land have all been benefited by his work.

The resolutions were unanimously passed.

On motion of Robert Manning it was voted that the officers and members of the American Association for the Advancement of Science are cordially invited to visit the halls, library, and exhibitions of this Society during the coming session of the Association in this city.

Agreeably to the Constitution and By-Laws the President appointed the following Committee to nominate suitable candidates for the various offices of the Society for the ensuing year: Charles M. Hovey, Charles O. Whitmore, Joseph H. Woodford, Charles M. Atkinson, William H. Spooner, Charles N. Brackett, and Charles F. Curtis.

On motion of Edwin A. Hall it was voted that a committee of three be appointed by the chair to prepare resolutions in memory of Daniel Waldo Lincoln; and Charles M. Hovey, O. B. Hadwen and Edwin A. Hall were appointed as that Committee.

On motion of Benjamin G. Smith it was voted that a committee of three be appointed to prepare resolutions in memory of Peter Smith. Benjamin G. Smith, William C. Strong, and Robert Manning were appointed as that Committee.

Adjourned to Saturday, September 4.

BUSINESS MEETING.

SATURDAY, September 4, 1880.

An adjourned meeting of the Society was holden at 11 o'clock, President Hayes in the chair.

William C. Strong, from the Committee to prepare resolutions in memory of Peter Smith, reported the following:

Peter Smith, of Andover, a member and benefactor of this Society, died at his residence, July 6th, in his seventy-eighth year. He was born in Brechin, Scotland, September 10th, 1802, and came to this country at the age of twenty years, and associated himself in business with his brother, who had preceded him. Mr. Smith has held a high position as an intelligent and successful manufacturer and merchant. He was a man of remarkable integrity and high-minded purposes, and in all his actions secured the implicit confidence of every one. His rare wisdom and accurate judgment in business affairs will be missed by those who so often sought his advice. Possessing abundant means he contributed liberally and cheerfully to such objects, public and private, as commended themselves to his judgment. His charities were carefully and judiciously bestowed, and he will be remembered with gratitude and affection by the numerous recipients of his kindness and bounty. Mr. Smith was very fond of horticulture. His love of flowers amounted almost to a passion. He loved to see them and to talk about them. The choicest varieties of flowers and fruits blossomed and ripened in his garden and greenhouses. In all the relations of life, as the head of a family, a citizen, and a Christian, he was universally respected and honored.

Whereas, God in his all wise providence has seen fit to remove by death a much esteemed and valued member of this Society, Peter Smith, therefore

Resolved, That we have learned with deep regret of the death of Mr. Smith, who was as beloved and esteemed by us for his kindness as a friend and associate as he was respected for his honesty and integrity as a merchant.

Resolved, That a copy of these resolutions be transmitted to the family of our departed friend, as a mark of our sympathy with them in their bereavement.

The resolutions were unanimously passed.

Charles M. Hovey, Chairman of the Committee to prepare resolutions in memory of Daniel Waldo Lincoln, presented the following:

The recent death of D. Waldo Lincoln, an old and honored member of the Massachusetts Horticultural Society, has caused a deep feeling of sorrow to every member of this association, therefore

Resolved, That in his death the Society mourns the loss of one of its earnest co-workers in its useful sphere, and one who in his early manhood took the liveliest interest in everything pertaining to horticulture. He was one of the first to introduce to our collections the magnificent *Victoria regia*, which he successfully cultivated and flowered at his grounds in Worcester, and his labors in the infancy of pomology were eminently valuable and important, in the diffusion of a knowledge of fruit culture throughout the heart of the Commonwealth. Passing some time ago from the domain of horticulture to the laborious duties of his later years, he exhibited in them the thoroughness and ability which characterized all that he undertook, and though absorbed in public duties which severely taxed his energies, he did not lose his earlier love for the gratifying pursuit which was the engrossing employment of his younger days.

Resolved, That in his death this Society loses one who, by his practice and example, conferred renown upon the science to which he devoted so many years, and that every member sympathizes with his family in their great bereavement.

Resolved, That these resolutions be entered upon the records, and a copy be forwarded to the family of the deceased.

Mr. Hovey added that he had known Mr. Lincoln for many years, and had had much correspondence with him. He was a worthy son of a worthy sire, and exerted a lasting influence for good in the central county of the Commonwealth.

President Hayes, before putting the question, asked permission to add his tribute to the memory of Mr. Lincoln. As a director of the Boston and Albany Railroad he was intimately acquainted with Mr. Lincoln, the President. It was a great delight to Mr. Lincoln to turn from railroad matters to discuss some new flower or superb fruit, and he was proud that so many of the directors were interested in horticulture. He often spoke of his own early interest in horticulture; and one occasion and the pleasure which Mr. Lincoln

took in it—when, on the adjournment of a meeting, the directors visited the beautiful grounds of Ignatius Sargent, of Brookline, a member of the board—was especially remembered by the speaker. Mr. Lincoln's earnest mind was shown in every work he undertook, and not only this Society but the community have lost a most worthy man.

The resolutions were unanimously passed.

C. M. Hovey, chairman of the Nominating Committee, asked for another week in which to prepare their report, which was granted.

The following named persons, having been recommended by the Executive Committee, were on ballot duly elected members of the Society:

Hiram A. Oakman, of North Marshfield.
Albert W. Nickerson, of Dedham.
Starkes Whiton of Hingham Centre.
F. J. Dutcher, of Hopedale.

Adjourned to Saturday, September 11.

BUSINESS MEETING.

Saturday, September 11, 1880.

An adjourned meeting of the Society was holden at 11 o'clock, President Hayes in the chair.

Charles M. Hovey, Chairman of the Nominating Committee, presented the report of that committee, which was accepted. It was voted that the Committee be continued and requested to nominate candidates in place of any who may decline before the election.

The meeting was then dissolved.

BUSINESS MEETING.

Saturday, October 2, 1880.

A stated meeting of the Society, being the annual meeting for the choice of officers, was holden at 11 o'clock, President Hayes in the chair.

The Recording Secretary stated that notice had been given of the meeting in accordance with the Constitution and By-Laws.

The chair appointed John G. Barker, E. W. Buswell, and John C. Hovey, a committee to receive, assort, and count the votes given, and report the number.

The polls were opened at five minutes past eleven o'clock.

Rev. A. B. Muzzey, from the Committee on Publication, announced that the History of the Society was expected to be ready for distribution to subscribers early in the next week, and stated that, having carefully examined the manuscript of the work, he wished to congratulate the Society on the completion of this interesting volume, and trusted that every member would supply himself with a copy.

The President said that he was much gratified at the announcement of Mr. Muzzey, and that, having also examined the work, he was able to join in the approval which the Committee had given it, and to speak of it as a book which should be in the possession of every member.

Marshall P. Wilder spoke of the accuracy of the Society in the nomenclature of fruits and flowers, and of its influence in promoting such accuracy throughout the country, of which he saw the evidence in the correctness of the names of fruits, during a visit to the orchards of California. He spoke of the interest which he had felt in the Society from the beginning, and said that all would want to read the History, for it would perpetuate the names of many whom we have loved and of others who will soon join them.

Charles M. Hovey said that, as one of the Committee having the work in charge, he read the manuscript as first prepared, which gave an account of the connection of the Society with Mount Auburn, and of the labors of Gen. Dearborn, whose whole heart was in the Experimental Garden. He trusted that we should find in the volume what we should love to read,—a record of men who have served the Society faithfully, and whose memory we revere.

The polls were closed at five minutes past twelve o'clock. The Committee to receive, assort, and count the votes given, and report the number, reported by their Chairman that the whole number was seventy-seven; necessary for a choice, thirty-nine; and the candidates having that number were, agreeably to the Constitution and By-Laws, declared by the President to be elected officers and standing committees of the Society for the year 1881.

The following named persons, having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society:

George O. Wales, of Braintree.
Hon. John S. Brayton, of Fall River.
John L. Gardner, of Brookline.
Mrs. E. C. Pickering, of Cambridge.
Mrs. J. Marcou, of Cambridge.

Adjourned to Saturday, November 6.

BUSINESS MEETING.

Saturday, November 6, 1880.

An adjourned meeting of the Society was holden at 11 o'clock, Vice-President Benjamin G. Smith in the chair.

Marshall P. Wilder, from the Executive Committee, reported a recommendation that the amount to be offered for Prizes and Gratuities for the year 1881 be $3,050. The Committee also recommended the appropriation of $200 for the Library Committee for the purchase of magazines and newspapers, binding of books, and incidental expenses of the Committee; $150 for the Committee on Publication and Discussion; and $250 for the expenses of the Committee of Arrangements—all these amounts being the same as were appropriated for 1880. The report was accepted, and agreeably to the Constitution and By-Laws was laid over until the stated meeting in January.

Charles M. Hovey, Chairman of the Committee appointed November 1, 1879, to procure a portrait of Charles O. Whitmore, Chairman of the Finance Committee, made a verbal report that a portrait had been procured and placed in the Hall without expense to the Society.

John Owen presented the following preamble and resolutions in memory of Dr. Charles C. Hamilton:

Whereas, Our Society has intelligence of the sudden death of one of its most distinguished Corresponding Members, the late

Charles Cotnam Hamilton, M.D., of Canard, King's County, Nova Scotia,—one who has done much to advance scientific and practical agriculture and pomology in all the British Provinces of America, and

Whereas, Dr. Hamilton's progressive ideas and valuable contributions to his favorite department of knowledge have not been confined to his native valley of Cornwallis, made famous largely by his unceasing exertions, but covered a wider field of operations by his sympathy with congenial minds (not merely in the Dominion but in this country), by his writings, and by the frequent exhibition here of the proofs of his success, obtained under circumstances of climate and soil less friendly to farm and garden culture than our own, and

Whereas, In his character as a private citizen, and as a public man, and throughout a long, extensive, and useful professional career he united in himself those elements of human greatness and goodness which won for him the admiration and love of all brought within the circle of his influence and action, therefore,

Resolved, That in the death of Dr. Hamilton not only this Society but the whole North American community suffers a severe and irreparable loss.

Resolved, That the strong bond of coöperation and the ties of no common friendship, are hereby sundered, to be reunited, we trust, in that spirit-peopled land of perpetual bloom and fruitage, beyond the grave, while his example still remains to cheer and strengthen us.

Resolved, That these sentiments of respect and affection, with the earnest expression of sincere condolence, be presented to the bereaved family of the deceased.

The resolutions were seconded by Marshall P. Wilder, who said he had come, at considerable inconvenience, to express his grief at the death of Dr. Hamilton, and his sense of the loss of a Vice-President of the American Pomological Society. Dr. Hamilton was a genial, gentle, and Christian man, and the speaker agreed with all said in his praise in the resolutions. No man in Nova Scotia has done so much for agriculture, horticulture, and the medical profession. In all that seeks to promote the welfare of mankind he was foremost. He was president of the Fruit Growers' Association of Nova Scotia, and his skill as a fruit grower was attested by a bunch of Black Hamburg grapes, grown in the open air in his garden, and

brought by his son to the speaker, who placed it on the exhibition table before the meeting. Dr. Hamilton's death was caused by exhaustion from attending agricultural and horticultural fairs, which he had continued for three successive weeks though warned by his family that he was over-exerting himself.

Charles M. Hovey said that he had known Dr. Hamilton as Vice President of the American Pomological Society, and as a man of excellence, of commanding presence, and of great zeal and perseverance in horticulture, and he felt his loss deeply.

The presiding officer spoke of Dr. Hamilton as remarkable for his skill as a physician, and distinguished as a horticulturist and a warm hearted, genial gentleman.

The resolutions were unanimously adopted.

Charles M. Hovey presented the following resolutions in memory of Dr. Augustus Torrey:

The Massachusetts Horticultural Society, having learned with profound regret of the death of Dr. Augustus Torrey, of Beverly, an old and honored member,

Resolved, That in the death of Dr. Torrey the Society has lost another of its older members, who has for many years honored it by his presence, encouraged it by his example, and aided it by his frequent contributions of beautiful fruits.

Resolved, That the members are duly sensible of the services of Dr. Torrey in the cause of horticulture, as well as of his life long labors in behalf of suffering humanity. An able and eminent physician, attentive to his arduous duties, he still found leisure moments which he gave to the cultivation of his garden. Courteous and genial in his intercourse; kind and considerate to those whom it was his duty to serve; an upright man, a sincere friend, and an esteemed citizen, he leaves a record that is an honor to himself and to the science which was his chosen profession.

Resolved, That in the death of Dr. Torrey this Society keenly feels the loss of one of its older associates and continued friends, and desires to express its appreciation of the labors of those who in earlier days contributed so much to its influence, and who have been interested in its welfare.

Resolved, That the members deeply sympathize with the family in their great bereavement and sorrow.

Resolved, That these resolutions be entered upon the records, and that a copy be transmitted to the family of the deceased.

Mr. Hovey added that he had known Dr. Torrey for thirty years, and that he was interested in all branches of horticulture, and always came to the annual exhibitions, bringing choice specimens of fruits. By his genial manners and his zeal and assiduity as a horticulturist he aided to bring the Society to the position it now occupies, and which he hoped the younger members would maintain.

Rev. A. B. Muzzey seconded the resolutions. He said that he had probably known Dr. Torrey longer than any other person present,—they having been college class-mates. He was a sincere and good man, whose whole character might be held up as a model. He was a great lover of horticulture, and made valuable contributions to the exhibitions of the Society. At the last meeting of the Society, when he sat by the side of the speaker, he seemed much affected by the death of his wife and soon followed her. He was a man whom we need have no fear of over-praising, and a great loss to the Society.

Marshall P. Wilder desired to express his concurrence in what had been said. The last time he met Dr. Torrey, the latter spoke of the great pleasure he felt in the meeting, but said, "We shall not stay here much longer."

The resolutions were unanimously passed.

Malcolm C. Greene, of Dorchester, and
James A. Rumrill, of Springfield,

having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society.

Adjourned to Saturday, December 4.

BUSINESS MEETING.

Saturday, December 4, 1880.

At the last meeting the Society adojurned to 11 o'clock today, but as no quorum was present it

Adjourned to Saturday, December 11.

BUSINESS MEETING.

SATURDAY, December 11, 1880.

An adjourned meeting of the Society was holden at 11 o'clock, President Hayes in the chair.

The Annual Report of the Committee on Plants and Flowers was read by William H. Spooner, Chairman. Accepted and referred to the Committee of Publication.

Mr. Spooner presented the following vote:

Voted, That the Prospective Prize of $40 for the best Seedling, Flowering or Foliage plant (other than Rose, Camellia, Azalea Indica, Tree Pæony, Hardy Rhododendron, or Hardy Azalea,) be awarded to Joseph Tailby for the Seedling Carnation Grace Wilder, as recommended in the report of the Committee on Plants and Flowers.

On motion of W. C. Strong, seconded by C. M. Hovey, the above vote was laid on the table.

The annual report of the Committee on Fruits was read by John B. Moore, Chairman.

The Annual Report of the Committee on Publication and Discussion was read by William C. Strong, Chairman.

The Annual Report of the Committee on Gardens was read by Benjamin G. Smith, Chairman.

The Annual Report of the Committee on the Library was read by Robert Manning, who also read his annual report as Secretary.

These reports were severally accepted and referred to the Committee on Publication.

On motion of John C. Hovey further time was granted to the Committee on Vegetables and the Committee of Arrangements to present their reports.

The President, as Chairman of the Executive Committee, presented the List of Prizes for 1881, with the approval of that committee. It was voted that the List of Prizes be laid on the table for one week for examination by the members.

JOHN E. PEABODY, of Salem,

having been recommended by the Executive Committee, was, on ballot, duly elected a member of the Society.

Adjourned to Saturday, December 18.

BUSINESS MEETING.

SATURDAY, December 18, 1880.

An adjourned meeting of the Society was holden at 11 o'clock, President Hayes in the chair.

C. H. B. Breck, Chairman of the Committee of Arrangements, asked further time to report, which was granted.

The List of Prizes for the year 1881 was taken from the table, and on motion of John B. Moore was accepted, adopted, and referred to the Committee on Publication. It was voted that the Committee on Establishing Prizes have liberty to add such Special Prizes as may be offered to the Society, subject to the approval of the Executive Committee.

NATHANIEL T. KIDDER, of Boston, and
HENRY H. WITHINGTON, of Jamaica Plain,

having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society.

The meeting was then dissolved.

REPORT

OF THE

COMMITTEE ON PLANTS AND FLOWERS,

FOR THE YEAR 1880.

By WILLIAM H. SPOONER, Chairman.

Your Committee are enabled to report a continued interest in the work of the Society in this department. The principal exhibitions have been well sustained, and the weekly shows have found competitors for most of the prizes offered, and we are led from the year's experience to commend the wisdom of returning to the system of weekly prize exhibitions, even if the amount of the money prizes is much smaller than formerly; contributors appearing usually to consider an award of a first or second prize as of far more value than a like or even a larger sum in a gratuity.

We are pleased to notice a very great increase in the exhibits of choice and rare plants, and the idea has suggested itself to your Committee, and to others of the active members of the Society, that a change might be made in the prizes for greenhouse plants at the Annual Exhibition by the substitution or addition of another class of prizes, perhaps in silver cups, and making the present class of money prizes of a smaller amount, to be awarded for a smaller class of plants. The Committee are of the opinion that such a course would add greatly to the interest of this show.

AZALEA AND ROSE EXHIBITION.

March 18.

Hardy Perpetual Roses, forced. — The only competition in

these was between John B. Moore and Joseph Tailby. Mr. Moore was first with twelve cut blooms, very fine flowers, of

Alfred Colomb.	Mabel Morrison.
Capt. Christy.	Marquise de Castellane.
Étienne Levet.	Mme. Baronne de Rothschild.
Gen. Jacqueminot.	Paul Neron.
Glory of Waltham.	Prince Camille de Rohan.
John Hopper.	Sir Garnet Wolseley.

He was also first for six cut blooms, with

Dupuy Jamain.	Mme. Chas. Crapelet.
Édouard Morren.	Marie Baumann.
Lyonnais.	Victor Verdier.

There were no forced roses in pots exhibited.

Peter Henderson & Co., of New York, exhibited at this show the new Tea rose American Banner, a sport from Bon Silene, with striped flowers; we hardly think it will prove a valuable acquisition.

February 21st, F. L. Harris exhibited a hybrid seedling rose—a cross between the Cherokee and Isabella Sprunt, with the general characteristics of the former and the color of the latter.

March 13th, there was shown by Joseph Tailby a new Hybrid Perpetual rose, called Rosy Morn; color delicate peach shaded to salmon rose, large flower, delicately scented.

Indian Azaleas. — Marshall P. Wilder was again the only contributor in this department. His plants were fine, but we omit the list of varieties as they were very much the same as those exhibited by him last year.

Orchids were shown by F. L. Ames, James Cartwright, and John L. Gardner; the latter exhibited a very fine plant of *Dendrobium nobile*, remarkably well grown.

At the Chrysanthemum Show, November 10th, F. L. Ames presented particularly fine orchids, taking the first prize for these plants, with *Dendrobium chrysanthum*, *Oncidium tigrinum*, and *Cypripedium Harrisianum;* and the second prize with *Cypripedium Dominianum*, *Chysis bractescens*, and *Rodriguezia secunda*.

Mr. Ames also took the first prize for a single plant with *Vanda cærulea*, and the second with *Oncidium macranthum*. He also exhibited for the first time the beautiful new *Cypripedium Spicerianum*.

January 3d, Joseph Tailby exhibited a fine plant of *Cypripedium insigne*, having nineteen flower spikes with two perfect flowers on each, and one of the spikes developing a third bud.

We missed C. B. Gardner's fine Cyclamens this season. Excellent Primulas were shown by Hovey & Co. and John L. Gardner; Cinerarias by John B. Moore, and Calceolarias by John L. Gardner.

Hyacinths. — This exhibit was made by John L. Gardner, and was grand; besides his prize lot, he had a very choice collection grown in pots or pans twelve inches in diameter and about eight inches deep, with from nine to thirteen bulbs in each; the flowers were in perfect condition for display and were most skillfully grown. Mr. Gardner was awarded the first prize, for

Gladiator, single red.
Lady Stanhope, single violet.
Mr. Thackeray, " "
Mont Blanc, single white.
Snowball, " "
Kaiser Ferdinand, single blue.
Czar Peter, " "
Minister Thorbecke, " "
Louis Philippe, double blue.

In his general collection Mr. Gardner had

Maria Catharina, single red.
Unica Spectabilis, single pink.
La Belle Blanchisseuse, single white.
Mirandolina, single white.
Nimrod, single purple.
Grand Lilas, single light purple.
La Nuit, single black-blue.
Othello, double "
Noble par Mérite, double pink.

RHODODENDRON SHOW.

June 5.

Hardy Rhododendrons and Azaleas. — As last year, President Francis B. Hayes was the only exhibitor for the Hunnewell Premiums, receiving the first and second prizes for twelve named varieties, and for the single truss of Rhododendrons; also the first for twenty-four hardy Azaleas. E. Sheppard was first for twelve trusses of Azaleas. For a single truss the first and second prizes went to President Hayes for beautiful blooms of Ornatissimum and Souvenir de Prince d'Orange.

H. H. Hunnewell presented as usual a choice collection of Rhododendrons and Azaleas, but not for competition.

Clematis. — The competition for the prizes offered this season for the first time was not as large as might have been expected. Those for the early flowering varieties were taken by J. H. Woodford and John B. Moore. Of the late varieties, Francis B. Hayes was the only contributor.

ROSE EXHIBITION.

June 18.

The extremely warm weather in June was demoralizing to hardy roses; consequently, excepting a few individual stands, the exhibition was not up to the standard of last year; though, on account of the heat, the date was changed from the 22d to the 18th. The principal contributors were John B. Moore, William Gray, Jr., Francis B. Hayes, J. S. Richards, and William H. Spooner.

Hardy Perpetuals. — For the best twelve varieties, John B. Moore was first with

Comtesse d'Oxford.	Mme. Baronne de Rothschild.
Étienne Levet.	Mme. Marius Cote.
Ferdinand de Lesseps.	Mons. Boncenne.
François Michelon.	Mrs. Laxton.
Louis Van Houtte.	Mrs. Baker.
Marie Baumann.	Prince Camille de Rohan.

Francis B. Hayes was first with six varieties, but no list has been furnished the Committee.

William H. Spooner was first with three varieties: Mons. Boncenne, Thomas Mills, and Mme. la Baronne de Rothschild.

Moss Roses. — John B. Moore was first with six varieties, viz.:

Crested.	Mme. Ugale.
Four Seasons.	Zaïre.
Gracilis.	———

Also for three varieties, with Mme. Surette, Mme. Alboni, and Salet.

Your Committee were again fortunate in having several silver cups to award as special prizes, besides the Challenge Cup of last year; with these continued inducements we venture to predict a very considerable addition to the competition another year.

A Silver Cup valued at $25, for three specimen roses of different

varieties, was awarded to Francis B. Hayes, for Mme. Lacharme, Pierre Notting, and Prince Paul Demidoff. These were truly superb flowers; the Mme. Lacharme was especially beautiful in size, form, and color, and this variety was probably never before exhibited in a more perfect condition.

A Silver Cup valued at $25, for six specimen roses of different varieties, was awarded to William Gray, Jr., for

Comtesse d'Oxford.
Étienne Dupuy.
Exposition de Brie.
Ferdinand de Lesseps.
Magna Charta.
Marquise de Gibot.

A Silver Cup valued at $25, for twelve specimen roses of different varieties, was awarded to John B. Moore, for

Comtesse d'Oxford.
Étienne Levet.
Ferdinand de Lesseps.
François Michelon.
Gen. Forey.
Horace Vernet.
John Hopper.
Louis Van Houtte.
Mlle. Marie Rady.
Mme. Baronne de Rothschild.
Mons. Boncenne.
Mons. E. Y. Teas.

A Silver Cup valued at $25, for three specimen roses of one variety, went to John B. Moore, for Sir Garnet Wolseley.

A Silver Cup valued at $25, for six roses of one variety, was awarded to William Gray, Jr., for Mme. la Baronne de Rothschild.

A Silver Cup valued at $25, for twelve roses of one variety, was awarded to John B. Moore, for Prince Camille de Rohan.

The Challenge Cup, valued at $150, was again awarded to William Gray, Jr., without competition. Your Committee did not consider the roses offered for this prize entirely worthy, but did not feel at liberty to withhold the award. The terms of this prize are that the winner shall hold it for three successive years, and this is the second award to Mr. Gray.

August 21st, President Francis B. Hayes exhibited a group of twelve Hybrid Perpetual roses of the Paul Neron variety, averaging six inches in diameter, and he has grown many even larger than this. We doubt whether any of the European growers can do as much. Indeed Mr. Hayes has had remarkable success in the cultivation of roses, having made continuous weekly exhibitions of fine blooms, — sometimes of better quality even than those of the Annual Rose Show, — and extending from June to October.

ANNUAL EXHIBITION.

September 14, 15, 16, and 17.

The Annual Exhibition of last year was considered the best in fine plants ever held by the Society, but that of this year exceeded even the best, and was truly grand in beautiful and rare specimens — far in advance of the anticipations of your Committee. The work of our Society shows an increasing tendency toward the encouragement of the cultivation of rare and choice plants, and it may be a question for further consideration whether we should not make two classes of prizes at our Annual Show; one for the larger and more remarkable specimens, and another for a smaller grade of plants.

The principal exhibitions of plants were made by S. R. Payson, H. H. Hunnewell, F. L. Ames, W. Gray, Jr., and President Hayes; all of them were of the finest quality, and the effect produced was like transporting the beholder to the luxuriant realms of the tropic zone.

Twelve Greenhouse Plants.—The first prize was awarded to S. R. Payson for:

Adiantum Farleyense.
Alocasia metallica.
Anthurium Warocqueanum.
Croton Disraeli.
Croton Youngi.
Cyanophyllium magnificum.
Dieffenbachia Bausei.
Dracœna Mooreana.
Eurya latifolia var.
Ficus Parcelli.
Maranta Veitchii.
Nepenthes Hookeri.

The second prize was awarded to F. L. Ames for:

Acalypha mosaica.
Alpinea vittata.
Anthurium Warocqueanum.
Cordyline (Dracœna) indivisa.
Croton nobilis.
Croton Queen Victoria.
Croton variabilis.
Curculigo recurvata var.
Kentia australis.
Maranta Makoyana.
Phenecophorum Sechellarum.
Phyllotœnium Lindeni.

Specimen Plant, not variegated.—The first prize was given to Hovey & Co., for *Cycas revoluta;* the second prize to F. L. Ames for *Sciadophyllum pulchrum.*

Specimen Flowering Plant.—The first and second prizes went to H. H. Hunnewell for *Lapageria rosea*, and *Ixora coccinea.*

Variegated Leaved Plants, six varieties, to William Gray, Jr., for:

Agave schidigera.
Alocasia macrorhiza var.
Ananassa sativa var.
Anthurium crystallinum.
Dracœna Hendersonii.
Fittonia argyroneura.

Specimen Plant, variegated.—The first prize went to S. R. Payson for a beautiful plant of *Croton variegatum;* the second to John L. Gardner for *Eurya latifolia variegata.*

Caladiums.—William Gray, Jr., took the first prize for six, with

Boieldieu.
Chantini.
Houletti.
Meyerbeer.
Madame Duval.
Rogieri.

Hovey & Co. received the second for:

Alfred Bleu.
Dr. Lindley.
Hérold.
Prince Albert Edward.
Rossini.
Triomphe de l'Exposition.

Adiantums.—For six varieties S. R. Payson was first with:

A. amabile.
A. cuneatum.
A. formosum.
A. gracillimum.
A. scutum.
A. setulosum.

Hovey & Co. were second with:

A. amabile.
A. concinnum.
A. concinnum latum.
A. cuneatum.
A. decorum.
A. excisum multifidum.

Dracænas.—For six varieties, William Gray, Jr., was first with:

D. amabilis.
D. Chelsoni.
D. magnifica.
D. Mooreana.
D. Shepherdii.
D. Youngi.

Palm.—For a single specimen the first prize went to William Gray, Jr., for *Livistona rotundifolia;* the second to Hovey & Co. for *Pritchardia Pacifica.*

Nepenthes.—The first prize for three was awarded to F. L. Ames for *N. distillatoria*, *N. Chelsoni*, and *N. intermedia.* Mr. Ames also exhibited the new and rare *N. Veitchii.*

Agaves.—The first prize for six went to Henry Ross; the second to Hovey & Co., for:

A. applanata.
A. cyanea.
A. Gilbeyii.
A. heteracantha cærulea.
A. hystrix.
A. Nissonii.

Benjamin Gray contributed three species of *Nymphœa*, viz., *Devoniensis*, *cœrulea*, and *dentata*. Mr. Gray has given special attention to this class of plants, and these were well grown specimens, worthy of his acknowledged skill.

H. H. Hunnewell as usual exhibited a beautiful collection of choice plants, but they were not offered in competition for prizes. They were—

Alocasia gigantea.
Alocasia metallica.
Croton longifolium var.
Croton pictum.
Cyanophyllum magnificum.
Dieffenbachia imperialis.
Dieffenbachia Bausei.
Dracœna Harrisii.
Dracœna Youngi.
Musa ensete.
Musa superba.
Phyllotœnium Lindeni.
Sphœrogyne latifolia.

He also exhibited a fine plant of *Terminalia elegans* which, from its appearance, may prove a remarkably beautiful decorative foliage plant and useful for florists' purposes. The leaves are long and narrow, tapering to a point; in color a bronzy-green with numerous pinkish veins through them; midrib bright pink or red; under side light green. Williams says of this plant, "It grows in a regular pyramidal form, and the beauty of its outline and its handsomely marked and glossy leaves constitute it one of the most appropriate plants for the decoration of the dinner table, and a never failing source of pleasure in the stove."

From F. B. Hayes, came a fine specimen of the choice evergreen stove plant, *Cupania filicifolia*.

Dahlias have been shown in less quantity than before; excellent flowers were presented by John L. Gardner, Samuel G. Stone, James Nugent, and John Parker. At the Annual Exhibition Mr. Gardner was first for twelve flowers, with

Delicata.
Gladiator.
Harlequin.
James Cocker.
La Phare.
Miss Caroline.
Mrs. Henshaw.
Peri.
Pre-eminent.
Queen of Beauties.
Rifleman.
Titian.

John Parker was first for six, with

Gladiator.
James Cocker.
John Standish.
King of Primroses.
Monarch.
Paul of Paisley.

James Nugent was first for a single flower, with Peri.

Mr. Gardner exhibited his dahlias in a neat wooden stand, admirably designed for the purpose, after the English model. It is arranged in sections eighteen inches in length by twelve in width, to display six blooms, which are received in zinc tubes about three inches in depth (for holding water) in which are fitted wooden sockets for the flowers. These tubes are placed two and one-half inches from the edge of the stand and five inches from each other, and the whole rests upon supports from four to five inches high.

CHRYSANTHEMUM SHOW.

November 10.

This was noticeably fine in choice plants, which, together with the propitious weather, made it a very attractive exhibition.

H. L. Higginson, Henry P. Walcott, Norton Brothers, and James Comley were the contributors of plants. Mr. Higginson's plants were remarkably fine, giving evidence, as usual, of the skill of his gardener, Mr. Clark. Dr. Walcott also presented excellent plants. Those of Messrs. Norton, though not large, were well grown, as were also those of Mr. Comley.

Cut Chrysanthemum flowers were shown in larger numbers than ever before, and we notice this feature of the display with pleasure. The Chysanthemum is certainly a plant for the million,—easily grown either in the garden or the house, and we hope, with the proposed changes in the prizes offered for this class of plants and flowers, to see an exhibition next autumn such as has never been made in this country, and if our active members will unite to this end we can make it a success. Let us each make an effort, if only with a single plant or a few flowers, all contributing something towards a grand result.

H. L. Higginson was first for six large-flowered varieties, with

Bolivar.
Dr. Sharpe.
Golden Queen of England.
Hero of Stoke Newington.
Jardin des Plantes.
Prince of Wales.

H. P. Walcott was second, with

Bronze.
Julie Lagravère.
Mrs. Dixon.
Mrs. Forsythe.
Pink Perfection.
Souvenir de Mercédes.

Mr. Higginson was first with six Pompons, viz. :—

Bob.	La Fiancée.
Duriflet.	Model of Perfection.
Gen. Canrobert.	Nellie.

H. P. Walcott was first for four Japanese varieties, with M. Crousse, Fulton, Purple King, Bouquet Fait.

For a specimen plant, large-flowered, Mr. Higginson was first, with Golden George Glenny. Dr. Walcott was second, with Guernsey Nugget.

For a specimen plant, pompon-flowered, James Comley was first, with Model of Perfection. Mr. Higginson was second and third, with Boule de Neige and Niobe.

For a specimen plant of a Liliputian variety, Dr. Walcott was first, with Mrs. Hutt, and Mr. Higginson second, with Amietta.

For a specimen plant, of a Japanese variety, Dr. Walcott was first and second, with Figaro and Fleur Parfaite.

For cut flowers, twelve large-flowered varieties, Dr. Walcott was first, with a beautiful group of the best flowers of this class we have ever seen, viz. :

Bronze.	L'Orient.
Charles Montariol.	Mrs. Dixon.
Félicité.	Mrs. Forsythe.
George Peabody.	Mrs. Mary Morgan.
Guernsey Nugget.	Prince of Wales.
Jardin des Plantes.	Souvenir de Mercédes.

Francis B. Hayes was second, with

Alarm.	Lord Stanley.
Bronze Jardin des Plantes.	Miss Mary Morgan.
Empress of India.	Ne Plus Ultra.
Guernsey Nugget.	Progne.
Jardin des Plantes.	Rose Perfection.
Lady Slade.	Snowball.

For twelve cut flowers, pompon varieties, E. Sheppard was first, with

Anna.	Maroon Model.
Duriflet.	Mme. de Vatry.
Gen. Canrobert.	Nellie.
Golden Circle.	Norma.
La Fiancée.	Rose Trevenna.
Maria.	Volunteer.

Joseph Clark was second with

Bob.	Nellie.
Candeur.	Pasque Fleur.
Gen. Canrobert.	Perfection.
Goldfinder.	Rose Bella.
La Fiancée.	Stella.
Mme. Mary.	White Trevenna.

Having thus given an account of the special exhibitions of the year, we proceed to make some comments on the most prominent flowers for which prizes were offered at the weekly shows, closing with remarks on some of the most interesting miscellaneous plants exhibited.

Iris Kæmpferi and varieties. — We are pleased to notice an increased cultivation of this beautiful plant, the contributors being F. Parkman, B. D. Hill, and Woolson & Co. of Passaic, N. J.; all exhibiting seedling varieties, many of the flowers of large size, indicating the possibilities of this plant for the future.

Carnations. — Joseph Tailby has again shown his seedling, Grace Wilder, in fine condition, and has entered it for the prospective prize for a seedling flowering plant. Your Committee had an opportunity of seeing the plants in a most luxuriant state last May at Mr. Tailby's place in Wellesley, where he had a large house planted mostly with this variety, which had been in bloom all winter; and we have no hesitation in commending it as one of the best seedling carnations we have ever seen. A First Class Certificate of Merit was awarded to it last year, and we now unanimously recommend that the Prospective Prize of $40, for the best seedling flowering or foliage plant, be awarded to Joseph Tailby for the Carnation Grace Wilder.

Mr. Tailby has also exhibited several other seedlings, viz:

No. 9, or *Fred Johnson.*—Flower medium in size, finely fringed, color bright carmine.

Princess Louise. — Large flower, deeply fringed, color bright pink, delightfully scented.

Dr. Whitney. — Flower medium sized, fringed, color pinkish carmine, some of its inner petals rolling up and showing the light color of the under surface; very fragrant.

Messrs. Hovey & Co. have several times exhibited their seedling carnation, Magnificent, which they offer for the prospective prize

for a seedling flowering plant. It has a large full flower, color bright scarlet shading to cherry; apparently a free bloomer and vigorous grower, but not strongly scented. We have not seen the plant growing. It was raised in 1878, and exhibited in February, 1879.

Perennial Phloxes, July 24th and August 7th, were shown only by John B. Moore, to whom all the prizes were awarded, for fine displays of flowers in the following varieties:

Auguste Rivière.	Mme. Froment.
Belldonville.	Mme. Moisset.
Charlotte Saison.	Mme. Prosper Laugier.
Czarina.	Mons. Aubry.
Député Berlet.	Mons. Valden Chuck.
D. Parrie.	Pandore.
Figaro.	Princess Louise.
Greville.	Richard Larios.
Heloïse.	Saison Rival.
Le Pôle Nord.	Van Houtte.
Michael Buchner.	White Lady.

August 7th there came from Hovey & Co. a new phlox, Pictet de la Rive; color pure white.

Gladioli. — The contributions to this department have been less than in former years. The most frequent exhibitors were James Cartwright and George Craft. Mr. Cartwright's were chiefly seedlings, which were noticeably fine; his named varieties were also choice flowers, well grown. His seedling, No. 84, is particularly promising, having a strong spike of well arranged flowers, in color similar to Meyerbeer, of a brilliant fiery red with light rose throat.

James F. C. Hyde has again exhibited his seedling, Hyde's White, which maintains its character of last year. Your Committee had the satisfaction of seeing it growing in Mr. Hyde's grounds at Newton this season, where it was conspicuous for the strength of its spike and the size and substance of its flowers; but as there was some mixture in the stock, they would prefer to see it another season before passing judgment. Several other seedlings were noticed at the same time, with strikingly developed double flowers, of large size, which may lead to a new class. The Annual Exhibition was unusually deficient in gladioli; partly owing doubtless to the heavy rains of the previous day.

Lilies. — Hovey & Co., Francis B. Hayes, B. G. Smith, and Mrs. E. S. Joyce were the contributors for these prizes, with excellent flowers; the first mentioned with a very large display, comprising *Lilium speciosum*, varieties Melpomene, Thalia, Polyhymnia, and Clio. These are beautiful and distinct seedlings of *L. speciosum*, remarkable for the size of the flowers, the very broad, smooth, flat petals, their deep coloring, and the large, bold, blood-red spots, which distinguish them at once from the parent species. They are dwarfer in habit than *L. speciosum*, with more thickly-set foliage, and shorter pedicels to the blossoms. Melpomene is remarkable for the depth of its color, which nearly covers the petals, leaving only a distinct white border upon each segment of the flower. The other varieties named are quite as remarkable for their distinct character.

Hovey & Co.'s collection also included the two following new lilies:

L. Leichtlini. — This is undoubtedly the most novel of any of the lilies recently introduced, its clear lemon-yellow flowers, conspicuously spotted with brown or claret color, being quite unlike those of any other lily. As yet the bulbs have not acquired sufficient strength to develop its real merits, but it promises to become one of the most distinct and desirable lilies. The flowers are not very large, — about four inches across; the petals are deeply revolute or reflexed; anthers brownish red; stems rather slender, two to three feet high, with from three to five flowers in a loose umbel; pedicels short and erect; the flower nodding and quite scentless.

L. Batemanniæ. — This quite distinct new and fine lily is placed by Mr. Baker in the Martagon group, and is stated to be closely allied to *L. Leichtlini*. It certainly has some resemblance to that species, but the flowers on our plant were open, cup shaped, about the same size, and not reflexed. The color is a clear, deep apricot, quite unspotted, and produced in umbels of from six to eight; stamens apricot color, style chocolate; stems, on moderately strong bulbs, three feet high, rather slender, with narrow foliage. It appears to be a species or variety worthy of a place in every collection.

November 20th Hovey & Co. placed on the table a beautiful flower of *Lilium Neilgherriense*. This is somewhat in the style of *L. longiflorum*, and doubtless one of the most beautiful of the

trumpet-flowered lilies. It is an Indian plant, and it is doubtful whether it can be cultivated in the open ground. Experiment only can determine this ; but as a greenhouse species it must hold a high rank. The stems are rather slender, growing from two to three feet high, with rather long, linear leaves, and terminated with from one to three large trumpet-shaped flowers, six to seven inches long, of a pale lemon color ; style slender, stamens yellow. A grand species.

The above descriptions are by Charles M. Hovey.

July 24th President Hayes presented a flower of a new lily called Kahamii, somewhat in the way of *Lilium pulchellum*, but in color a bright scarlet.

Tropæolums.—The competition for these prizes was sharply contested, and the exhibition was finer than ever before. March 18th and May 8th, Charles F. Curtis presented a fine stand of Spooner's New Fringed tropæolum ; color deep orange, base of the divisions dark maroon, petals deeply fringed, foliage light green, with much the character of *T. peregrinum;* a remarkably strong grower and profuse winter bloomer for the house. In the open ground it does not grow as luxuriantly or flower as freely.

August 14th, we had from Mrs. George F. Fisher an exceedingly pretty Tropæolum — a chance seedling which she has grown several years, with a small flower resembling that of *T. peregrinum* in form ; color brilliant scarlet, a free bloomer, with dark blueish-green foliage.

Native Plants. — July 17th, Mrs. C. N. S. Horner exhibited a very large and well arranged collection of native plants, with their names. This was without doubt the best among the many fine exhibits she has made, and your Committee were glad of the opportunity to express the high estimation in which the members of the Society hold her attainments as a practical botanist. Mrs. Horner has been a frequent contributor to this department during the season. Miss Maria E. Carter shared the honors in this department on the 5th of June, receiving the second prize. E. H. Hitchings has also been a frequent and valuable contributor, and we mention, among other rare plants brought by him, *Liparis liliifolia*, found in Milton, and probably the only perfect specimen ever shown here. Mr. Hitchings has several times shown *Botrychium ternatum;* also *Chrysopsis falcata*, and very fine specimens of *Rhododendron Rhodora* (*Rhodora Canadensis*).

Bouquets, Baskets of Flowers, and Table Designs. — We regret to notice a falling off in the exhibits of these. We hope the ladies, who have sustained this department with so much taste and skill, will renew their zeal hereafter, as it is certainly a very pleasing feature of our shows. We shall also hope to see an improvement in the arrangement of the vases of flowers. The design of dried leaves and flowers by Miss E. H. Craft, at the Annual Exhibition, was particularly commendable for the artistic skill of its arrangement.

Miscellaneous Plants. — April 17th, William S. Ewell exhibited a set of very fine new Coleus of vigorous growth and in desirable colors, as follows:

Aurora.
Butterfly.
Clown.
Fame.
Firefly.
Glow.
Magic.
Sparkler.
Stella.
Sunbeam.
Surprise.

We had also from the same, October 30th and November 10th, Pansies in variety, most of them flowers of large size and well defined colors.

May 1st, we had from John C. Hovey, *Narcissus bicolor* and varieties. The former is perfectly hardy, and one of the most beautiful, with golden-yellow trumpet and white perianth. It is very sweet scented.

June 26th, from the same, new hardy *Opuntias* (Cacti), as follows:

O. speciosa. — Color golden yellow, base of petals deep purple.

O. Missouriensis. — Bright lemon yellow.

O. Rafinesquiana. — Large yellow flower, centre bright purple. Also *O. monacantha*, *O. nana*, and *O. vulgaris*.

May 15th, Jackson Dawson exhibited several very striking, new and rare shrubs; among them *Staphylea Bumalda*, with a pure white flower.

June 5, Hovey & Co. exhibited excellent seedling *Epiphyllums*. They also exhibited a flower of the new yellow chrysanthemum, Étoile d'Or, the well known Paris daisy, with a long-stemmed single flower; which, we should judge, might be well adapted for use among florists.

Also the following new *Echeverias: E. canaliculata*, *E. rubella*, *E. perbula*, *E. undulata*, and *E. Peacockii;* also, *Aloe hybrida maculata.*

From C. H. Hovey came the new *Echeveria Hoveyii*, with delicately variegated markings. If it should bear the sun in bedding, it will prove an acquisition. The following description is by C. M. Hovey:

Echeveria Hoveyii. — This very remarkably variegated form of the *Echeveria* is as conspicuous as it is entirely distinct and beautiful. It is a hybrid between *E. farinosa* and *E. metallica glauca*, having leaves narrower and larger than the latter, and thinner and broader than the former. The ground color is a pale bluish-green, with a stripe of clear rosy pink on each side of the midrib, and an edging of pure white. These colors are brought out deeper and richer in the hottest sun, which it stands with impunity, only losing its colors in the shade or in the depth of winter, and taking them on again as soon as the sun or bright light returns in spring. It will undoubtedly prove a grand plant for distinct lines or central groups in beds of succulent.

At the Rose Exhibition, Francis B. Hayes presented a splendid plant of *Bougainvillea glabra*, one of the best ornamental flowering plants, and considered the finest of the genus.

September 5th, Isaac Sprague exhibited excellent specimens of a variety of Oaks, as follows:

Quercus alba: White oak.
" *discolor:* Swamp White oak.
" *prinoides:* Dwarf Chestnut oak.
" *ilicifolia:* Scrub oak.
" *coccinea:* Scarlet oak.
" *rubra:* Red oak.

At the Chrysanthemum Show, Robert Manning exhibited fruit of several varieties of *Celastrus*, *Euonymus*, and *Symphoricarpus.*

Following is a summary of Plants and Flowers for which prizes have been offered during the season, but for which there has been no competition.

March 1, Rose and Azalea Exhibition. Hybrid Perpetual Roses in pots, Hardy Flowering Shrubs in pots, Tulips and Jonquils in pots.

May 8, Pelargonium Exhibition. Zonale, Bronze, and Double

Zonale Pelargoniums in pots; Spring Herbaceous Plants, open culture; Hyacinths, open culture.

June 5. Tree Pæonies; Hardy Flowering Shrubs, cut blooms; Clematis in pots.

June 18, Rose Exhibition. Herbaceous Pæonies, Summer Herbaceous Plants.

June 28. Delphiniums.

July 3. Japan Iris.

July 10. Hydrangeas, Amaryllis in pots.

July 17. Orchids.

July 24. Exotic Ferns.

July 31. Stocks.

September 14–17, Annual Exhibition. Lycopods, Sarracenias, Cacti, Succulents (other than Agaves, Yuccas, and Cacti), Tuberous Rooted Begonias, Evergreens for Hunnewell Premiums.

November 10, Chrysanthemum Show. Heliotropes in pots.

Many of these flowers were exhibited during the season, but not at the time named in the Schedule of Prizes.

The amount of prizes and gratuities awarded is $1,479 out of the appropriation of $1,500, leaving a balance of $21. Prizes have been awarded from the Hunnewell fund to the amount of $41.

All of which is respectfully submitted.

WM. H. SPOONER,
PATRICK NORTON,
E. H. HITCHINGS,
F. L. HARRIS,
WILLIAM J. VASS,
JAMES CARTWRIGHT,
CHARLES W. ROSS,

Committee on Plants and Flowers.

PRIZES AND GRATUITIES AWARDED FOR PLANTS AND FLOWERS.

January 3.

Gratuity :—

Joseph Tailby, *Cypripedium insigne*, ... $3 00

February 14.

Gratuities :—

James Cartwright, *Lælia anceps*, ... 2 00
William Gray, Jr., *Cypripedium villosum*, ... 3 00

February 21.

Gratuity :—

Joseph Tailby, *Lycaste Skinneri*, var., ... 1 00

February 28.

Gratuities :—

Hovey & Co., *Imatophyllum Van Houttei*, ... 1 00
" " Azalea Mattapan, ... 1 00

March 6.

Gratuity :—

James Comley, Cut Flowers, ... 2 00

March 13.

Gratuities :—

Joseph Tailby, Hybrid Perpetual Rose, Rosy Morn (new), . . 1 00
James Comley, Hybrid Perpetual Roses, ... 1 00

AZALEA AND ROSE SHOW.

March 18.

Indian Azaleas.—Six named varieties, in pots, Marshall P. Wilder, $15 00
Second, Marshall P. Wilder, ... 10 00
Hybrid Perpetual Roses.—Twelve cut blooms, named varieties,
John B. Moore, ... 5 00
Second, Joseph Tailby, ... 3 00
Six cut blooms, named varieties, John B. Moore, ... 3 00
Tender Roses.—Six cut blooms, named varieties, James Comley, . 2 00
Second, William J. Vass, ... 1 00

ORCHIDS.—Winter blooming, three plants in bloom, F. L. Ames, . $10 00
Second, James Cartwright, ... 6 00
Single plant, in bloom, John L. Gardner, ... 5 00
Second, Hovey & Co., ... 3 00
CYCLAMENS.—Six plants, in pots, in bloom, the second prize to James Cartwright, ... 3 00
Single plant, in bloom, Hovey & Co., ... 2 00
HEATHS.—Single plant, in bloom, John L. Gardner, ... 3 00
PRIMULAS.—Three plants, in bloom, Hovey & Co., ... 2 00
Second, John L. Gardner, ... 1 00
CINERARIAS.—Four varieties, in pots, in bloom, the second prize to John B. Moore, ... 3 00
Third, John B. Moore, ... 2 00
Single plant, in bloom, John B. Moore, ... 2 00
VIOLETS,—Six pots, in bloom, John L. Gardner, ... 3 00
Second, C. B. Gardiner, ... 2 00
PANSIES.—Six distinct varieties, in pots, in bloom, John B. Moore, . 3 00
Second, John B. Moore, ... 2 00
Third, John B. Moore, ... 1 00
HYACINTHS.—Nine bulbs, in pots, in bloom, John L. Gardner, . 5 00
NARCISSUS.—Four pots, two bulbs in each, John L. Gardner, . . 4 00
CAMELLIAS.—Display of named varieties, cut flowers, not less than twelve blooms, Hovey & Co., ... 4 00
Second, Hovey & Co., ... 3 00
Six cut blooms, John L. Gardner, ... 3 00
CUT FLOWERS.—Display, filling fifty bottles, not including roses, Mrs. A. D. Wood, ... 3 00
BASKET OF FLOWERS.—Best arranged, James O'Brien, . . . 3 00

Gratuities:—

Marshall P. Wilder, Azalea Decora, ... 2 00
James Comley, Cut Roses, ... 2 00
M. H. Merriam, " " 1 00
John L. Gardner, nine pans Hyacinths (splendid) 6 00
" " " six pans Polyanthus, ... 1 00
" " " two *Boronia megastigma*, ... 2 00
F. L. Ames, *Phalænopsis Schilleriana*, ... 5 00
" " " *Oncidium leucochilum*, ... 2 00
Hovey & Co., Seedling Camellias, ... 2 00
" " Collection of Plants, ... 6 00
Mrs. L. P. Weston, *Tropæolum tricolorum*, ... 1 00
Charles F. Curtis, Spooner's New Fimbriated Tropæolum, . . 1 00
Edwin A. Hall, *Cereus flagelliformis*, ... 1 00
William J. Vass, Passiflora flowers, ... 2 00
J. Warren Merrill, Ferns on Log, ... 1 00
E. H. Hitchings, *Hepatica triloba*, ... 1 00
Mrs. E. M. Gill, Azaleas and other Cut Flowers, ... 3 00
John B. Moore, Vase of Flowers, ... 2 00

MARCH 20.

Gratuity: —

James Comley, Roses, ... $1 00

MARCH 27.

Gratuities: —

John C. Hovey, *Narcissus Bulbocodium*, ... 1 00
Hovey & Co., *Cattleya citrina*, ... 1 00

APRIL 3.

Gratuities: —

Mrs. A. D. Wood, Cut Flowers, ... 1 00
Mrs. E. M. Gill, " " 1 00

APRIL 10.

Gratuities: —

James Cartwright, *Dendrobium Wardianum*, ... 3 00
Mrs. A. D. Wood, Cut Flowers, ... 2 00
Mrs. E. M. Gill, " " 1 00

APRIL 17.

Gratuities: —

Mrs. A. D. Wood, Cut Flowers, ... 2 00
Mrs. E. M. Gill, " " 1 00
James Comley, " Roses, ... 1 00
James Cartwright, Oxalis flowers, ... 2 00

APRIL 24.

Gratuities: —

Mrs. A. D. Wood, Cut Flowers, ... 2 00
Mrs. E. M. Gill, " " 1 00
James Comley, *Lilium candidum* flowers, ... 1 00
John L. Gardner, Plants, ... 5 00

MAY 1.

Gratuities: —

E. Sheppard, Cut Flowers, ... 1 00
Mrs. A. D. Wood, Cut Flowers, ... 1 00
Mrs. E. M. Gill, " " 1 00
William J. Vass, " Roses, ... 1 00
Mrs. C. N. S. Horner, Native Flowers, ... 1 00

PELARGONIUM SHOW.

May 8.

Pelargoniums. — Four named variegated Zonale varieties, William Gray, Jr.,	$5 00
Six named Show or Fancy varieties in pots, John L. Gardner,	6 00
Calceolarias. — Six varieties in pots, John L. Gardner,	5 00
Tulips. — Twenty-five blooms, distinct colors, John L. Gardner,	3 00
Second, J. S. Richards,	2 00
Table Design. — Other than a basket of flowers, John B. Moore,	3 00
Second, Mrs. E. M. Gill,	2 00

Gratuities : —

Charles F. Curtis, Spooner's New Fimbriated Tropæolum,	2 00
Mrs. E. M. Gill, Hydrangea Thomas Hogg,	2 00
John Parker, Pelargonium Peter Grieve,	1 00
William Gray, Jr., *Ananassa sativa aurea var.*,	3 00
J. Geist, Spike of *Lilium longiflorum*,	1 00
J. S. Richards, Collection of Tulips,	3 00
John L. Gardner, Collection of Plants,	10 00
Benjamin G. Smith, Pansies,	2 00
William J. Vass, Tea Roses,	3 00
John L. Gardner, Two Lobelia Plants,	2 00
Mrs. A. D. Wood, Cut Flowers,	2 00
E. Sheppard, " "	2 00
Miss E. M. Harris, Vase of Flowers,	2 00
E. H. Hitchings, Native Flowers,	2 00

May 15.

Gratuities : —

Jackson Dawson, Rare Shrubs,	1 00
E. H. Hitchings, *Rhodora Canadensis*,	1 00
James Comley, Cut Flowers,	1 00
Mrs. A. D. Wood, " "	1 00
Mrs. E. M. Gill. " "	1 00

May 22.

Gratuities : —

Marshall P. Wilder, Tree Pæonies,	2 00
E. A. Story, Shrubs,	1 00
Miss E. M. Harris, Vase of Flowers,	1 00
Mrs. E. M. Gill, Cut Flowers,	1 00
Mrs. E. S. Joyce, " "	1 00
Mrs. C. N. S. Horner, Native Flowers,	1 00

May 29.

Gratuity : —

Benjamin G. Smith, Rhododendrons and Azaleas,	1 00

RHODODENDRON SHOW.

June 5.

Hunnewell Premiums.

Hardy Rhododendrons.—Twelve named varieties, one truss each, Francis B. Hayes,	$8 00
Second, Francis B. Hayes,	6 00
Single truss of blooms, Francis B. Hayes,	4 00
Second, Francis B. Hayes,	2 00
Hardy Azaleas. — Twenty-four named varieties, one truss each, Francis B. Hayes,	12 00
Twelve named varieties, one truss each, E. Sheppard,	7 00
Cluster of trusses, of one variety, Francis B. Hayes,	2 00
Iris (Tuberous Rooted). — Twelve named varieties, E. Sheppard,	4 00
Cut Flowers. — Display filling 100 bottles, Mrs. E. M. Gill,	4 00
Second, Mrs. A. D. Wood,	3 00
Third, George Craft,	2 00
Native Plants. — Display of named species and varieties, Mrs. C. N. S. Horner,	4 00
Second, Miss Maria E. Carter,	3 00
Clematis. — Display of cut blooms of early named varieties, Joseph H. Woodford,	3 00
Second, John B. Moore,	2 00
Azalea mollis. — Twelve trusses of different varieties, Francis B. Hayes,	8 00

Gratuities: —

H. H. Hunnewell, Rhododendrons and Azaleas,	10 00
Francis B. Hayes, Collection of Rhododendrons,	5 00
James Cartwright, Orchids,	3 00
Miss E. M. Harris, Pæonies,	1 00
Hovey & Co., Display of Flowers,	5 00
E. A. Story, " "	1 00
Mrs. A. C. Kenrick, Display of Flowers,	1 00
Benj. G. Smith, Cut Flowers,	3 00
Francis B. Hayes, " "	3 00
E. Sheppard, " "	2 00
Mrs. E. S. Joyce, " "	2 00
George Craft, " "	2 00
E. H. Hitchings, *Liparis liliifolia*,	1 00

June 12.

Gratuities: —

F. L. Ames, Orchids,	5 00
Francis B. Hayes, Cut Flowers,	2 00
Mrs. E. M. Gill, " "	1 00
Mrs. A. D. Wood, " "	1 00
George Craft, " "	1 00
Mrs. C. N. S. Horner, Native "	1 00

ROSE EXHIBITION.

June 18.

Special Prizes.

Hybrid Perpetual Roses.—Twenty-four varieties, three specimens of each, a Challenge Cup, value $150, to be held by the winner against all comers for three consecutive years, and then to be his property absolutely, to William Gray, Jr.

Three Roses of different varieties, Francis B. Hayes, silver cup, value, ... $25 00

Six Roses, of different varieties, William Gray, Jr., silver cup, value, ... 25 00

Twelve Roses, of different varieties, John B. Moore, silver cup, value, ... 25 00

Three Roses, of one variety, John B. Moore, silver cup, value, 25 00

Six Roses, of one variety, William Gray, Jr., silver cup, value, . 25 00

Twelve Roses, of one variety, John B. Moore, silver cup, value, . 25 00

Regular Prizes.

Hardy Perpetual Roses.—Six new varieties, sent out since 1876, John B. Moore, ... $6 00

Twenty-four named varieties, three of each, William Gray, Jr., . 20 00

Twelve named varieties, John B. Moore, ... 10 00

Second, William Gray, Jr., ... 8 00

Third, Francis B. Hayes, ... 6 00

Six named varieties, Francis B. Hayes, ... 6 00

Third, John B. Moore, ... 4 00

Three named varieties, William H. Spooner, ... 4 00

Second, John B. Moore, ... 3 00

Moss Roses.—Six named varieties, three clusters of each, John B. Moore, ... 5 00

Second, William H. Spooner, ... 3 00

Three named varieties, three clusters of each, John B. Moore, . 3 00

Tea or Bourbon Roses.—Twelve cut flowers, William J. Vass, 5 00

General Display.—J. S. Richards, ... 10 00

Second, John B. Moore, ... 8 00

Third, Francis B. Hayes, ... 5 00

Stove and Greenhouse Plants.—Six distinct, in bloom, F. L. Ames, 10 00

Second, Hovey & Co., ... 8 00

Specimen Plant, of a kind for which no special prize is offered, regard being had to a new or a rare variety, E. Sheppard, . 6 00

Gloxinias.—Six named varieties, in pots, Hovey & Co., . . . 5 00

Sweet Williams.—Thirty trusses, not less than six distinct varieties, E. Sheppard, ... 3 00

Second, James Nugent, ... 2 00

Vase of Flowers.—Best arranged, the second prize to Mrs. E. M. Gill, ... 3 00

Gratuities: —

Norton Brothers, two Baskets of Roses,	$2 00
William J. Vass, Collection of Tea Roses,	3 00
W. C. Strong, Tea Roses,	3 00
F. F. Raymond, Moss Roses,	2 00
P. J. Saunders, Hybrid Perpetual Roses, in pots,	2 00
Warren Heustis, two Boxes of Roses,	2 00
Hovey & Co., Collection of Plants,	5 00
John B. Moore, Plants,	3 00
John L. Gardner, "	4 00
William S. Ewell, eight new Coleus,	5 00
Edwin A. Hall, *Cereus flagelliformis*,	1 00
Hovey & Co., Geraniums and Carnations,	1 00
E. Sheppard, Tuberous Begonias,	2 00
Woolson & Co., Passaic, N. J., Collection of Lilies,	2 00
Mrs. A. D. Wood, Cut Flowers,	3 00
George Craft, " "	2 00
James Nugent, " "	2 00
E. A. Story, " "	2 00
James Comley, " "	1 00
Mrs. E. S. Joyce, " "	1 00
E. Sheppard, " "	1 00
William J. Vass, " "	1 00
Miss A. C. Kenriek, " "	1 00
Woolson & Co., Native Flowers,	2 00
E. H. Hitchings, " "	1 00
Miss K. A. Hill, " "	1 00
Mrs. E. M. Gill, Roses and Cut Flowers,	2 00

STRAWBERRY SHOW.

JUNE 26.

CUT FLOWERS.—Display, filling one hundred bottles, Mrs. A. D. Wood,	$4 00
Second, George Craft,	3 00

Gratuities: —

Francis Parkman, *Iris Kæmpferi*,	2 00
B. D. Hill, " "	1 00
Francis B. Hayes, Display of Roses,	1 00
Joseph H. Woodford, Clematis and Calendula,	1 00
Mrs. E. S. Joyce, Cut Flowers,	1 00

JULY 3.

CARNATIONS AND PICOTEES.—Twelve cut blooms, distinct kinds, James Nugent,	3 00

Cut Flowers.—Display, filling 100 bottles, Mrs. A. D. Wood,	$4 00
Second, Mrs. E. M. Gill,	3 00
Third, Mrs. L. P. Weston,	2 00
Table Design.—Best arranged, Mrs. A. D. Wood,	3 00

Gratuities:—

Francis B. Hayes, Roses and Clematis,	2 00
James Comley, Tea Roses,	2 00
Benjamin G. Smith, Carnations,	2 00
Hovey & Co., "	1 00
George Craft, Cut Flowers,	2 00
E. H. Hitchings, *Rhododendron maximum*,	2 00
Mrs. C. N. S. Horner, Native Flowers,	3 00

July 10.

Vase of Flowers.—Best arranged, James O'Brien,	5 00

Gratuities:—

Francis B. Hayes, Roses and Clematis,	2 00
James Nugent, Roses and Hollyhocks,	1 00
Mrs. A. D. Wood, Cut Flowers,	2 00
Mrs. L. P. Weston, " "	2 00
Mrs. E. M. Gill, " "	1 00
James O'Brien, " "	1 00
George Craft, " "	1 00
James Comley, " "	1 00

July 17.

Hollyhocks.—Twelve blooms, of twelve distinct colors, E. Sheppard,	4 00
Second, George Craft,	3 00
Six blooms, of six distinct colors, John B. Moore,	2 00
Second, James Nugent,	1 00
Three blooms, of three distinct colors, Mrs. E. M. Gill,	1 00
Single spike, the second prize to James Nugent,	1 00
Cut Flowers.—Display, filling 100 bottles, Mrs. A. D. Wood,	4 00
Second, James O'Brien,	3 00
Third, Mrs. E. M. Gill,	2 00

Gratuities:—

Francis B. Hayes, Roses, Clematis, etc.,	2 00
Miss E. M. Harris, Hollyhocks,	2 00
Mrs. E. M. Gill, "	1 00
E. Sheppard, " Lilies, etc.,	2 00
George Craft, " etc.,	1 00
" " Cut Flowers,	2 00
James Nugent, " "	1 00
John B. Moore, Roses,	2 00

July 24.

Perennial Phloxes.—Six named varieties, one spike each, John B. Moore,	$3 00
Second, John B. Moore,	2 00
Pelargoniums.—Twelve double and single varieties, one truss each, the second prize to Mrs. E. M. Gill,	1 00

Gratuities: —

Francis B. Hayes, Roses, Clematis, Lilies, etc.,	3 00
John B. Moore, Roses and Phloxes,	1 00
Woolson & Co., Passaic, N. J., Collection of Phloxes,	1 00
Hovey & Co., *Allamandas*,	1 00
Herbert Gleason, *Tritomas*,	1 00
E. S. L. Dolliver, Hollyhocks,	2 00
George Craft, Cut Flowers,	3 00
Mrs. E. M. Gill, " "	2 00
Mrs. L. P. Weston, " "	2 00

July 31.

Balsams.—Twelve spikes, not less than eight varieties, the second prize to John B. Moore,	1 00
Cut Flowers.—Display, filling 100 bottles, Mrs. E. M. Gill,	4 00
Second, Mrs. A. D. Wood,	3 00
Third, Mrs. L. P. Weston,	2 00
Collection of twenty-five named varieties of Annuals and Herbaceous Perennials, other than bulbus rooted, Mrs. E. S. Joyce,	4 00

Gratuities: —

Francis B. Hayes, Hybrid Perpetual Roses,	5 00
" " " Dianthus, etc.,	2 00
James Cartwright, Gladioli,	3 00
Hovey & Co., Lilies,	1 00
John B. Moore, Roses and Lilies,	1 00
Woolson & Co., Passaic, N. J., Herbaceous Plants,	1 00
James Nugent, *Daturas*,	1 00
E. H. Hitchings, Native Plants,	1 00
George Craft, Cut Flowers,	3 00
E. Sheppard, " "	2 00

August 7.

Perennial Phloxes.—Ten distinct named varieties, one spike each, John B. Moore,	4 00
Second, John B. Moore,	3 00
Petunias.—Collection, filling fifty bottles, one flower in a bottle, George Craft,	3 00
Second, E. Sheppard,	2 00

Verbenas.—Fifty bottles, single trusses, E. Sheppard,	$3 00
Second, James Nugent,	2 00
Third, George Craft,	1 00
Cut Flowers.—Display, filling 100 bottles, Mrs. A. D. Wood,	4 00
Second, James Nugent,	3 00
Third, Mrs. E. M. Gill,	2 00
Native Ferns.—Collection, Mrs. C. N. S. Horner,	3 00
Gratuities:—	
Francis B. Hayes, Roses, Marigolds, etc.,	3 00
James Cartwright, Gladioli,	3 00
John L. Gardner, *Achimenes*,	3 00
E. Sheppard, Phloxes, Verbenas, etc.,	2 00
Benjamin G. Smith, Pinks,	1 00
George Craft, Cut Flowers,	3 00
Mrs. E. S. Joyce, " "	1 00
Mrs. C. N. S. Horner, Native Plants,	2 00

August 14.

Gladioli.—Display of named and unnamed varieties, filling 100 bottles, James Cartwright,	6 00
Second, George Craft,	4 00
Single spike, George Craft,	1 00
Phlox Drummondi.—Collection, Francis B. Hayes,	3 00
Second, George Craft,	2 00
Third, Mrs. E. M. Gill,	1 00
Cut Flowers.—Collection of twenty-five named varieties of Annuals and Herbaceous Perennials, other than bulbous rooted, Francis B. Hayes,	4 00
Second, Hovey & Co.,	3 00
Third, George Craft,	2 00
Gratuities:—	
Francis B. Hayes, Hybrid Perpetual Roses,	3 00
James Nugent, *Brugmansia*,	1 00
J. W. Manning, Phloxes and Gladioli,	1 00
William H. Spooner, Tropæolums,	1 00
Mrs. L. P. Weston, Cut Flowers,	2 00
George Craft, " "	2 00
Mrs. A. D. Wood, " "	2 00
Mrs. E. M. Gill, " "	1 00
E. A. Story, " "	1 00
E. H. Hitchings, Native "	1 00

August 21.

Asters, Large Flowered.—Thirty flowers, not less than ten varieties, James Nugent,	4 00
Second, John L. Gardner,	3 00

Third, Mrs. A. D. Wood,	$2 00
Fifteen flowers, not less than six varieties, Mrs. E. M. Gill,	3 00
Pompons.—Sixty blooms, not less than six varieties, in bunches of three of the same variety, James Nugent,	3 00
Second, Mrs. A. D. Wood,	2 00
Display, filling 150 bottles, one flower in each, James Nugent,	4 00

Gratuities: —

Francis B. Hayes, Hybrid Perpetual Roses,	2 00
James Cartwright, Gladioli,	2 00
George Craft, Gladioli,	2 00
" " Display of Flowers,	2 00
Mrs. A. D. Wood, Cut Flowers,	2 00
Mrs. E. M. Gill, " "	2 00
Mrs. L. P. Weston, " "	2 00
E. A. Story, " "	1 00
E. Sheppard, " "	1 00
Mrs. E. S. Joyce, " "	1 00

August 28.

Lilies.—Display of *Lilium lancifolium*, cut flowers, Hovey & Co.,	3 00
Second, Francis B. Hayes,	2 00
Tropæolums.—Display, filling 25 bottles, William H. Spooner,	3 00
Second, Charles F. Curtis,	2 00
Cut Flowers.—Display, filling 150 bottles, Mrs. E. M. Gill,	4 00
Second, George Craft,	3 00
Third, James Nugent,	2 00
Native Plants.—Display of named species and varieties, one bottle each, Mrs. C. N. S. Horner,	3 00

Gratuities: —

Hovey & Co., Lilies in pots,	2 00
Miss S. W. Story, Lilies,	1 00
Benjamin G. Smith, "	1 00
Mrs. E. S. Joyce, "	1 00
William H. Spooner, Collection of Tropæolums,	2 00
Francis B. Hayes, Hybrid Perpetual Roses,	2 00
Hovey & Co., Petunias, etc.,	1 00
George Craft, Gladioli,	2 00
Mrs. E. S. Joyce, Asters,	1 00
C. W. Ross, Cut Flowers,	2 00
Mrs. L. P. Weston, " "	2 00
Herbert Gleason, " "	1 00

September 4.

Double Zinnias.—Twenty flowers, not less than six varieties, Francis B. Hayes,	4 00
Second, William H. Spooner,	3 00
Third, James Nugent,	2 00

DIANTHUS.—Annual and Biennial varieties,—collection filling fifty bottles, single trusses, Francis B. Hayes, ... $4 00
MARIGOLDS.—Collection, filling 25 bottles, single trusses, Francis B. Hayes, ... 3 00
Second, George Craft, ... 2 00
CLEMATIS.—Summer blooming varieties, display of cut blooms, Francis B. Hayes, ... 5 00

Gratuities:—

George Craft, Gladioli, ... 2 00
" " Asters, ... 1 00
Francis B. Hayes, Hybrid Perpetual Roses, ... 2 00
S. G. Stone, Dahlias, ... 2 00
Mrs. L. P. Weston, Cut Flowers, ... 2 00
James Nugent, " " 1 00
Mrs. E. M. Gill, " " 1 00
E. Sheppard, " " 1 00
Mrs. A. D. Wood, " " 1 00
Mrs. E. S. Joyce, " " 1 00

ANNUAL EXHIBITION.

SEPTEMBER 14, 15, 16, and 17.

GREENHOUSE AND STOVE PLANTS. — Twelve of different varieties, Samuel R. Payson, ... $30 00
Second, F. L. Ames, ... 25 00
SPECIMEN PLANT, NOT VARIEGATED.—Of a kind for which no special prize is offered, Hovey & Co., ... 5 00
Second, F. L. Ames, ... 4 00
SPECIMEN FLOWERING PLANT, H. H. Hunnewell, ... 5 00
Second, H. H. Hunnewell, ... 4 00
VARIEGATED LEAVED PLANTS. — Six varieties, not offered in the collection of greenhouse plants, William Gray, Jr., . . 12 00
SPECIMEN PLANT, VARIEGATED.—Not offered in any collection, Samuel R. Payson, ... 5 00
Second, John L. Gardner, ... 4 00
CALADIUMS.—Six varieties, William Gray, Jr., ... 5 00
Second, Hovey & Co., ... 4 00
FERNS.—Six named varieties, J. Warren Merrill, ... 8 00
ADIANTUMS.—Six varieties, Samuel R. Payson, ... 6 00
Second, Hovey & Co., ... 4 00
DRACÆNAS.—Six named varieties, William Gray, Jr., . . . 8 00
PALM.—Single specimen, William Gray, Jr., ... 5 00
Second, Hovey & Co., ... 4 00
NEPENTHES.—Three plants, named, F. L. Ames, ... 6 00

AGAVES.—Six distinct varieties, Henry Ross, ... $6 00
Second, Hovey & Co., ... 4 00
GLADIOLI.—Best display, and best kept during the exhibition, of named and unnamed varieties, filling 100 bottles, the second prize to George Craft, ... 6 00
DAHLIAS.—Twelve named varieties, John L. Gardner, . . . 5 00
Second, Samuel G. Stone, ... 4 00
Third, James Nugent, ... 3 00
Six named varieties, John Parker, ... 3 00
Second, Samuel G. Stone, ... 2 00
Third, Samuel G. Stone, ... 1 00
Single named flower, Fancy or Self, James Nugent, . . . 2 00
Second, John L. Gardner, ... 1 00
LILIPUTIAN DAHLIAS.—General display, filling fifty bottles, Samuel G. Stone, ... 4 00
CUT FLOWERS.—Best display, and best kept during the Exhibition, filling 150 bottles, Miss E. M. Gill, ... 16 00
Second, Mrs. A. D. Wood, ... 14 00
Third, James Nugent, ... 12 00
BASKET OF FLOWERS.—Best arranged, and best kept during the Exhibition, Miss S. W. Story, ... 5 00
TABLE DESIGN.—Best, and best kept through the Exhibition, not to exceed four feet in height, Mrs. E. S. Joyce, ... 5 00

Special Prize.

VASE OF FLOWERS.—Best arranged, and best kept during the Exhibition, Francis B. Hayes, ... 5 00

Gratuities: —

H. H. Hunnewell, Collection of Plants, ... 25 00
Hovey & Co., " " 10 00
Francis B. Hayes, " " 10 00
F. L. Ames, " " 5 00
" " " *Bertolonias*, ... 3 00
Benjamin Gray, *Nymphæas*, ... 10 00
John L. Gardner, two plants of *Dracæna terminalis*, . . . 2 00
Norton Brothers, Collection of Ferns, ... 7 00
J. Warren Merrill, Case " " 3 00
Albert Adams, Large Plant of Ivy, ... 2 00
S. G. Stone, Dahlias and Asters, ... 2 00
Macey Randall, Dahlias, ... 1 00
William H. Spooner, Collection of Tropæolums and Nasturtiums, . 3 00
Francis B. Hayes, Hybrid Perpetual Roses, ... 2 00
John B. Moore, " " " 1 00
Mrs. L. P. Weston, Cut Flowers, ... 6 00
George Craft, " " 1 00
Miss E. H. Craft, Design of Dried Flowers and Leaves, . . . 4 00
E. H. Hitchings, Collection of *Botrychium ternatum*, . . . 1 00

SEPTEMBER 25.

Gratuities : —

Francis B. Hayes, Roses, Clematis, etc.,	$2 00
Mrs. E. M. Gill, Cut Flowers,	1 00
S. G. Stone, Dahlias,	1 00
B. G. Smith, Asters,	1 00
E. H. Hitchings, *Botrychiums*,	1 00
Isaac Sprague, Oaks in variety,	1 00

OCTOBER 2.

DAHLIAS.—Twelve named varieties, John L. Gardner,	5 00
Second, Samuel G. Stone,	4 00
Third, Macey Randall,	3 00
Six named varieties, John L. Gardner,	3 00
Second, Macey Randall,	2 00
Third, Samuel G. Stone,	1 00
VASE OF FLOWERS.—Best arranged, Mrs. A. D. Wood,	4 00
Second, Mrs. E. M. Gill,	3 00

Gratuities : —

Francis B. Hayes, Hybrid Perpetual Roses,	2 00
Samuel G. Stone, Dahlias,	3 00
Macey Randall, "	1 00
James Nugent, " and Zinnias,	1 00
Mrs. A. D. Wood, Cut Flowers,	1 00
Miss S. W. Story, " "	1 00
George Craft, " "	1 00

OCTOBER 23.

Gratuity : —

Samuel G. Stone, Collection of Dahlias,	2 00

CHRYSANTHEMUM SHOW.

WEDNESDAY, NOVEMBER 10.

CHRYSANTHEMUMS.—Six Large Flowered, H. L. Higginson,	$8 00
Second, H. P. Walcott,	6 00
Six Pompons, H. L. Higginson,	8 00
Four Japanese, H. P. Walcott,	6 00
Second, H. P. Walcott,	4 00
Specimen Plant, Large Flowered, H. L. Higginson,	4 00
Second, H. P. Walcott,	3 00
Specimen Plant, Pompon, James Comley,	4 00
Second, H. L. Higginson,	3 00
Third, H. L. Higginson,	2 00

Specimen Plant, Liliputian, H. P. Walcott,	$2 00
Second, H. L. Higginson,	1 00
Specimen Plant, Japanese, H. P. Walcott,	4 00
Second, H. P. Walcott,	3 00
Twelve Large Flowered, cut specimens, H. P. Walcott,	3 00
Second, Francis B. Hayes,	2 00
Twelve Pompon Flowered, cut specimens, E. Sheppard,	3 00
Second, Joseph Clark,	2 00
General Display, named or unnamed, cut specimens, F. B. Hayes,	5 00
Second, E. Sheppard,	4 00
Third, Joseph Clark.	3 00
Orchids.—Three named varieties, F. L. Ames,	6 00
Second, F. L. Ames,	4 00
Single Plant, in bloom, F. L. Ames,	3 00
Second, F. L. Ames,	2 00
Hand Bouquets.—Pair, the second prize to Mrs. E. S. Joyce,	2 00
Table Design.—Best arranged, Mrs. A. D. Wood,	3 00
Second, Mrs. E. M. Gill,	2 00

Gratuities:—

Norton Brothers, Collection of Large Flowered Chrysanthemums,	5 00
" " " Pompon " "	5 00
James Comley, Chrysanthemums,	4 00
Mrs. A. D. Wood, Cut Specimens of Chrysanthemums,	2 00
Francis B. Hayes, " " " "	2 00
Mrs. E. M. Gill, " " " "	2 00
James Cartwright, Orchids, cut specimens,	3 00
R. Manning, Autumn Berries,	1 00
A. W. Nelson, two plants of *Epiphyllum truncatun*,	1 00
Benjamin Gray, *Nymphæa* flowers,	1 00
James Nugent, Cut Flowers,	3 00
Mrs. L. P. Weston, " "	2 00
Miss S. W. Story, " "	1 00

Silver Medals.

March 18. F. L. Ames, *Phalænopsis grandiflora aurea.*

June 5. Hovey & Co., Seedling *Epiphyllums.*

June 18. F. L. Ames, *Cypripedium Lawrencianum.*

" Francis B. Hayes, *Bougainvillea glabra.*

July 17. Mrs. C. N. S. Horner, Native Flowers.

August 7. Francis B. Hayes, *Agapanthus umbellatus.*

August 21. Francis B. Hayes, Beautiful Collection of Hybrid Perpetual Roses.

Annual Exhibition, September 14–17. F. L. Ames, Orchids.

November 10. F. L. Ames, *Cypripediuu Spicerianum.*

First Class Certificates of Merit.

January 3.	Joseph Tailby, Seedling Carnation No. 9.
February 21.	Francis B. Hayes, *Azalea mollis*, forced.
"	F. L. Harris, Hybrid Seedling Rose.
March 18.	Joseph Tailby, *Lycaste Skinneri delicatissima*.
"	Hovey & Co., Seedling Azaleas.
"	Peter Henderson, Rose Banner of America.
April 7.	William S. Ewell, New Coleus.
May 1.	John C. Hovey, *Narcissus bicolor* and varieties.
" 15.	Joseph Tailby, Seedling Carnation Fred Johnson No. 90.
" 29.	Francis Parkman, Seedling Clematis.
June 5.	Joseph Tailby, Seedling Carnation Princess Louise.
" 18.	" " " " Mrs. H. M. Priest.
"	Woolson & Co., Seedlings from *Iris Kæmpferi*.
" 26.	John C. Hovey, Seedling *Opuntias* in variety.
July 31.	John B. Moore, Seedling Phlox.
"	James Cartwright, Seedling Gladiolus No. 84.
" 24.	Francis B. Hayes, *Lilium Kahamii*.
August 21.	" " " Paul Neron Roses.
Annual Exhibition, September 14–17.	Hovey & Co., *Echeverias*.
" "	Francis B. Hayes, *Cupania filicifolia*.
" "	H. H. Hunnewell, *Terminalia elegans*.
" "	Charles H. Hovey, *Echeveria Hoveyii*.

Prospective Prize.

Joseph Tailby, Carnation Grace Wilder, ... $40 00

REPORT

OF THE

COMMITTEE ON FRUITS,

FOR THE YEAR 1880.

By JOHN B. MOORE, Chairman.

The Committee on Fruits submit the following report for the year 1880:

This year has been somewhat peculiar in its characteristics, not only from its remarkable earliness, but also from its long-continued periods of heat and dryness, which injured some species of fruit and favorably affected others.

The first fruit of the season, to which our attention was called, was the Strawberry. This is so palatable and healthful, and matures at a time when there is a scarcity of other fruits, and is really so easy to cultivate, that there is no good reason why it should not be more generally grown in all gardens, large or small.

The prize day for strawberries named in the Schedule was found to be too late, owing to the extreme earliness of the season, and was changed by the Committee to an earlier day. The fruit was injured by the dry weather, and was not shown in as great perfection as in some previous seasons; still there was a good exhibition, taking all the circumstances into consideration. Seedling strawberries were exhibited by D. L. Milliken, E. P. Richardson, and others; also eight varieties of French strawberries, by Hovey & Co. A description of these, and of other new fruits that have not been heretofore described, and that appeared desirable, will be found annexed.

Cherries.—The dry weather at the time of ripening was so favorable that the mature fruit has been quite free from rot, and it

has been shown in fair quantities, although there have not been as many individual competitors as usual for the prizes. About the only new variety was Warren Fenno's Norfolk, a seedling which he has heretofore exhibited, and which has already been described.

Currants exhibited this year have been very fine. The first prizes for red, white, and black, on each day, were awarded to the following varieties: Red, La Versaillaise; White, Dana's New White Transparent; Black, Black Naples. These varieties have become recognized as the leading kinds of each color to grow. There are other varieties, claimed to be later, and which may prove to be useful.

Raspberries were injured the previous autumn or winter, and there was neither the usual quantity nor as fine specimens as we have had on our tables in former years. William C. Strong exhibited the new Black Cap raspberry, Gregg, which was large and fine. This was the only new variety of any merit.

Blackberries.—All the prizes for this fruit have been awarded to the Dorchester, which is large and of fine quality, but the canes are a little tender and liable to winter-kill in exposed situations. No new varieties have been brought to the attention of the Committee.

Gooseberries have been exhibited in about the usual quantities, with perhaps a better show of the foreign varieties, some of which were of fine quality. The interest in the cultivation of this fruit does not appear to increase, neither does the demand for the fruit itself in the market.

Plums.—Last year we noticed an increase in the number of dishes and varieties of this fine fruit, and we are able to make the same report the present year. It is evident that good crops can be secured by proper care in preventing the disease called black wart (which we think can be done without much trouble), and by jarring the trees to shake off the curculios on something from which they can be gathered and destroyed. Perhaps the latter object could be accomplished more easily by planting the trees in a hen-yard, and encouraging the fowls to convert the curculio into poultry. By such treatment we are confident that a good crop of plums could be secured. The plum is a fine, luscious fruit, and is well worthy of our attention.

Peaches have been very fine this season, and have been presented in fair quantities. The leading varieties exhibited have

been Crawford's Early, Crawford's Late, and Stump the World. A number of new seedling peaches were shown, some of which may prove good. Mrs. Brett, a variety sent by J. H. Ricketts, of Newburgh, N. Y., was of fine quality.

Grapes.—The foreign varieties have been exhibited during the season in the usual quantities. Some of them were fine, but as a whole there was no marked improvement over previous years. The long dry season of the present year has been particularly favorable to what are termed native or hardy grapes. The word hardy is, however, applied to many only half-hardy varieties. There has been but little mildew, and varieties particularly liable to be injured by it have escaped, and matured a good crop of fruit. Such seasons, free from mildew, afford the natural conditions of weather to mature a good crop of grapes. These conditions existed in an unusual degree the present year, and the result has been that we have had much finer specimens and in greater abundance than is usual on our tables. We have also had a number of new seedlings exhibited this year for the first time.

At the Annual Exhibition we awarded First Class Certificates of Merit to the exhibitors of the Smith's Seedling, Niagara, Jefferson, and Hayes; and on the second day of October the same, for the Pocklington and Norwood. On the same day, Horace Eaton presented Eaton's Seedling. The bunches were very large, handsome, and good, maintaining its reputation of last year. We have now entered, for the prospective prize for grapes, the Niagara, Smith's Seedling, Hayes, Seward, D'Elboux Seedling, and Amber Queen. In addition to the above, the Prentiss and Duchess, both promising white grapes, have been shown. And last, but not least, comes our long esteemed friend, ex-President Wilder, as enthusiastic as in his younger days, with a new seedling of royal blood, a white grape of fine quality, a cross or hybrid between the Massasoit and Queen of Nice.

Pears.—Although there has been a small crop of this fruit the present year, yet we have had good exhibitions and specimens—some of the latter quite large. George S. Harwood's Sheldons, the dozen weighing twelve pounds; C. F. Curtis's dish of the same variety, twelve pounds five ounces; Beurre Clairgeau, from Mr. Curtis, twelve pounds ten ounces; and the same variety from Mrs. Langmaid, twelve pounds two and three-fourths ounces, were prominent among them, and very fine specimens. Many

other varieties have been shown, in nearly equal perfection. On the whole, the exhibition of pears has been somewhat less in quantity than usual, but quite satisfactory in quality. Two or three new seedlings have been shown, and are described among the new fruits.

Apples.—The year 1880 will be long remembered as a great apple year—as a year when they were so plenty that they wasted and decayed in great quantities under the trees and by the roadsides—when they were so abundant as to but little more than pay for the picking, packing, and transportation to market. Although they were so plenty, the specimens have been very large, fair, and handsome. The result of this has been that we have had numerous and fine specimens of this, the most important of all our fruits, placed on our tables. The apple, in the uses and economy of the household, is the standard fruit of this section of our country, and when as plenty as it has been this year, is a blessing to the poor, for any one could have a bushel or a barrel of apples for simply gathering them.

Next year, probably, there will be only a small crop of poor, wormy apples; wormy because these little pests in the apples have been able to go through their transformations without much disturbance, and are now quietly perfecting themselves in the ground for next year's campaign, whereas if they had been ground up and made into cider they would not have committed any further ravages. As a means of destroying insects the making of cider is a great invention. As a drink the article is not, by any means, pure juice of the apple alone. A method that would produce uniform crops of apples every year would confer untold benefits on the fruit grower.

On the 20th of November a collection of apples was exhibited from the Armada (Michigan) Agricultural Society, comprising the following varieties: Tompkins County King, Esopus Spitzenberg, Pound Sweet, Yellow Bellflower, Northern Spy, Talman's Sweet, Chillicothe Sweet, Peck's Pleasant, Roxbury Russet, Fallawater, Rhode Island Greening, and Baldwin. The first four varieties were remarkably fine. The Northern Spy was very large, and all the others were good. In the earlier days of the Society such exhibitions, under the auspices of the Committee on Synonymes of Fruit, were more common than now, and, though the object then aimed at, viz., the establishment of the nomenclature of fruits, is

now substantially accomplished, the Committee were much gratified to have an opportunity to examine fruits grown under circumstances of soil and climate different from our own.

We are under obligations to Robert Manning, Secretary, who is an expert, for making descriptions for the Committee, of new seedlings and other new fruits that appeared promising. These have been adopted by the Committee, annexed, and made a part of this report.

The amount appropriated for prizes for fruits was $950.00. The Committee have awarded in prizes and gratuities $854.00, leaving an unexpended balance of $96.00. The Committee have, for the last three years, reported an unexpended balance of the appropriation; not that it was not needed, but that it was the duty of the Committee to keep within the amount allowed them. The fact is precisely this, that the prizes should be more numerous, and some of them should be larger to secure such competition as would be desirable. We make this explanation in answer to the remark that has been made, that the committees do not spend all the money appropriated, and therefore do not need any more.

Respectfully submitted,

JOHN B. MOORE,
P. B. HOVEY,
E. W. WOOD,
JACOB W. MANNING,
O. B. HADWEN,
WARREN FENNO,

Fruit Committee.

NOTES ON NEW FRUITS.

By Robert Manning, Secretary.

Strawberries. *Seedling.*—From D. L. Milliken, June 5. Large, conical, sometimes wedge-shaped, tolerably regular; crimson toward the sun, bright and glossy. Flesh solid, orange scarlet, juicy, not so high-flavored as some; will rank as "good." From seed of the Seth Boyden, and free from the objectionable point of its parent in not ripening at the tip. It may prove desirable for its earliness.

Seedling.—From E. P. Richardson. Full medium size; rounded, slightly conical, regular; color bright and glossy; flesh light red, solid, juicy, with a peculiar but not pleasant flavor. From seed of La Constante.

Seedling.—From the same grower. Pretty large; regular, conical; bright, glossy color; flesh white, core large; juicy, very spirited. A cross between the Fillmore and Kentucky.

The eight varieties, next described, are of French origin, and were exhibited by Hovey & Co., June 26.

Chatelaine.—Medium size; very long oval, with a neck; crimson when fully ripe; flesh light red, with a large hollow core; not very juicy. The flavor resembles that of the Wood strawberries. It was thought by the Committee to be the best of the eight.

David.—Above medium size; conical, irregular, sometimes cockscombed; deep crimson; flesh red, with little core, juicy, having a brisk acid, but pleasant and refreshing.

Dr. Morère.—Large; mostly regular conical; good, bright color; flesh red, core large and hollow; juicy, with a peculiar flavor; will rank as "very good."

Rose.—Large; very long conical; light red—not of desirable color; flesh white, core pretty large; juicy, with a pleasant acid, and flavor resembling the Hautbois.

Lucie Flament.—Large; long conical, irregular; flesh tinged with red, core pretty large; rather harsh acid. Inferior to either of the preceding.

Ceres.—Large; irregular, much cockscombed; dark purplish red, resembling the Black strawberries; flesh red, solid, melting; brisk acid, but rich.

Pulchra.—Pretty large; roundish conical, but irregular; rather light red; flesh light red, core large; juicy; will not rank above "good."

Flora.—Medium size; crimson; pretty regular conical; not much core; juicy, acid harsh and astringent; the poorest of the eight.

The specimens of Sharpless shown by George Hill, on the 12th of June, and Warren Heustis on the 18th, were very large and handsome.

On the 19th of June, G. H. and J. H. Hale, of South Glastonbury, Conn., presented four new strawberries: the Glendale, Hart's Minnesota Seedling, Marvin, and Windsor Chief. The last three of these had never been shown here before. Though it was impossible to judge of their value we were gratified that the Messrs. Hale had taken the trouble to place them before the Society.

Apples. *Jacobs's Sweet.*—Originated at Medford, by Charles S. Jacobs. The tree sprang from seed about 1860, and fruited when about ten years old. Large, roundish, flattened, regular; yellow, with a handsome red cheek. A fall and early winter apple; excellent for baking, or for eating raw by those who like sweet apples. The specimens were exhibited by Franklin Patch, of Lexington, who stated that the tree is a vigorous grower.

Chilicothe Sweet.—Received from the Armada (Michigan) Agricultural Society, November 22. Large, roundish, somewhat conical; slightly irregular, and decidedly ribbed; yellow, nearly covered with streaks of red, which, on the sunny side, form a dense red cheek, spotted with rather obscure yellowish dots, and having traces of bloom which give it a purplish look. Flesh white, fine grained, sweet, not very juicy or rich, but pleasant, with a peculiar flavor. Season, November to January, or later. We have not found this variety described in any pomological work, and its origin is unknown.

Pears. *President Clark.*—From J. W. Talbot, September 16. Full medium size; turbinate, somewhat irregular and variable, some specimens approaching Doyenne shape; in general appearance strongly resembling the Kingessing, but having a brighter red cheek. When in perfection, clear lemon yellow. The best speci-

mens have a carmine cheek next the sun; flesh white, fine grained, very melting and juicy, slightly astringent, sweet and rich. "Very good" to "best." Season a little later than the Bartlett. Tree a very vigorous grower, with abundant foliage. A seedling, raised by the late Francis Dana.

Seedling No. 1.—From D. W. Lothrop, September 16. Full medium size; form between obovate obtuse pyriform and oblong obovate pyriform; skin smooth, pale yellow, with many irregular patches of russet, especially around the eye, sometimes taking a rich orange tint; flesh white, fine grained, buttery, very juicy, very rich. "Very good" to "best." It is a seedling from the Marie Louise, which it resembles in flavor. It was first exhibited in 1874, and is mentioned in the Report of the Fruit Committee for that year as of good quality.

Talmadge.—From Amos Bates, September 25. Small; between globular obtuse pyriform and obovate obtuse pyriform. Skin wholly covered with golden russet, which is thinnest on the blossom end, and in the sun assumes a warm orange tint; flesh juicy, buttery, and rich, with a decided quince flavor. Too small for market, but worthy the attention of amateurs.

Peach. *Mrs. Brett.*—Seedling, from J. H. Ricketts, of Newburgh, N.Y., September 16. Size, full medium, or large; rounded, a little conical, suture well defined; skin with little down; creamy white, in the sun purplish red, shading off in streaks and stipplings; flesh creamy white, juicy, with a brisk, sprightly flavor. Of excellent quality. Parts very freely from the stone.

Grapes. *D'Elboux Seedling.*—From seed of Telegraph, fertilized by Black Hamburg pollen. Bunch handsome, six and one-half inches in length. One of the two shown had a small shoulder. Berry large, round, black, with blue bloom; skin exceedingly thick and leathery. It has considerable pulp, which, however, is not tough, but allows the seed to separate easily. Sweet, juicy, and rich; entirely free from any foxy odor; flavor good, but difficult to define; holds on to the bunch well to the last. Originated by C. J. Copley, of Stapleton, Richmond County, N. Y., who states that the vine is healthy, hardy, a very strong grower, and productive; that the fruit ripens before the Hartford Prolific, and will keep until hard frost. It has fruited four years. Mr. Copley has entered it for the Prospective Prize.

Mineola.—Another of Mr. Copley's seedlings; from Telegraph,

fertilized by Chasselas Musqué. Bunch medium size; berry rather small, round, white, very sweet and rich, with aromatic flavor.

Cornelia.—Also from Mr. Copley; Telegraph seed, Chasselas Musqué pollen. Bunch small, not shouldered; compact, but not so much so as to prevent the full development of every berry; berries small, round, white, with an amber tint and a thin bloom; sweet and juicy, with a delicate but not high flavor; skin thick; holds on to the bunch well.

Clifton.—Also from Mr. Copley; Telegraph seed, White Frontignan pollen. Bunch six inches in length by five in width, very compact, largely shouldered; berries round, except when compressed by crowding; white, with an amber tint; juicy, rich, very sweet; pulp tough, skin thick and tough; holds on to the bunch well; no Frontignan flavor.

Roslyn.—Also from Mr. Copley; Diana seed, Hartford Prolific pollen. Bunch of good size, five inches long, shouldered, very compact; berry pretty large round, where not too much crowded—some are very much compressed; color variable, the largest berries being purplish, ard others bronzy green with thin bloom; pulp pretty firm; sweet, with a strong musky flavor; skin thick; holds on to the bunch very strongly.

White Delaware.—Another of Mr. Copley's seedlings. Bunch small, exceedingly compact, more so than any other variety that we recollect; berries very small, round (except as compressed by close packing in the bunch), green, with an amber tint in the sun, and thin bloom; skin very thick; sweet, with not much pulp, but what there is is pretty hard; no dropping from the bunch.

Elvira.—Raised by J. Rommell, of Morrison, Mo., from seed of Taylor, fertilized with pollen of Martha. Exhibited by Mr. Copley. This is, by the female parent, of the *riparia* or *cordifolia* species, of which Professor Husmann has great hopes as giving varieties free from the rot, which has been so destructive in the West. Bunch hardly of medium size, shouldered, not very compact; berry hardly of medium size, round, pale green, with white bloom, sometimes amber colored; skin very thin; pulp firm but not tough; not very juicy, sweet, with a pleasant but not high flavor. Though the berries were not very crowded many of them were cracked open.

Excelsior.—A seedling from J. H. Ricketts, of Newburgh, N. Y. Bunch handsome, berry large, round, of a delicate bronzy red color; flesh tender, melting, and juicy, with scarcely any hardness

of pulp; sweet and rich, with a musky flavor resembling that of the Muscat Hamburg.

Lady Washington.—Another seedling from Mr. Ricketts. Bunch large, shouldered, very handsome; berry of medium or large size, round; color unique—not white, but rather "ecru"—in the sun tinged with light reddish brown or lilac, and everywhere covered with a waxy bloom; skin moderately thick; pulp tender without being "meaty," very sweet, rich, spirited, and high-flavored. The berries dropped freely from the bunches, but this may have been caused by their being over-ripe.

Jefferson.—Another seedling from Mr. Ricketts, a cross between the Iona and Concord. Bunch medium size, compact, but not too much so; berry slightly oval, in color resembling the Catawba, but hardly as dark as a well-ripened Catawba; skin thick; pulp firm and "meaty;" the flavor strongly resembles that of the Catawba; holds on to the bunch remarkably well. The specimens exhibited were raised by J. G. Burrow, of Fishkill, N. Y.

Naomi.—Another of Mr. Ricketts' seedlings; exhibited by Mr. Burrow. Bunch long (seven and a half inches), slender, shouldered, of medium compactness; berry of medium size, round; color varying from pale green to lilac; very sweet and rich, with a strong musky flavor; juicy, pulp dissolves in the mouth; skin pretty thick; berry holds on to the bunch well.

Bacchus.—Another seedling from Mr. Ricketts. Bunch about six inches long, slender, rather loose, shouldered; berry small, round, black, with blue bloom; little pulp; sweet, vinous and rich.

No. 97.—Another seedling from Mr. Ricketts. Bunch large, loose, shouldered, in general appearance resembling a well-ripened bunch of Black Hamburg; berry large, round, black, with blue bloom; pulp dissolves in the mouth; juicy and very spirited—too much so for the majority of tastes; skin thick; holds on to the bunch well.

Early August.—A seedling from John Pocklington, Sandy Hill, Washington County, N. Y. Largest bunch, six and one-half inches in length, shouldered, rather loose; berry of medium size, round, pale green, with white bloom, seldom showing any amber tint; skin thin; holds on to the bunch well; juicy and spirited, but thought by the Committee not to be quite ripe.

Pocklington.—From the same source as the above, October 2. Bunch large, sometimes shouldered, moderately compact; berries

very large, round, pale green, with thin bloom, frequently amber-colored; skin of medium thickness; sweet and good, but has considerable hard pulp and foxy odor, which is not unpleasantly perceptible to the taste; seeds very large.

Seedling.—From Marshall P. Wilder; a cross between the Massasoit and Queen of Nice, and consequently of three-quarters foreign blood. Bunch of medium size, rather slender; the largest measured about six inches in length; generally shouldered, rather loose; berry below medium size, round, pale green, with a light bloom, inclining to amber when most exposed to the sun; skin pretty thick; pulp very slight, juicy and sweet; quality "very good;" resembles Allen's Hybrid.

Seedling.—From Vivus W. Smith, Syracuse, N. Y. The bunches sent varied in size, the largest being five and a half inches long, not much shouldered, rather loose and irregular; berries from medium to large size, round, pale green, with thin bloom; skin of moderate thickness; holds on to the bunch well; pulp tender, juicy, sweet, and spirited; acid within. It has a fragrance like that of a ripe pear. This was deemed one of the best in quality of the new grapes submitted to the examination of the Committee. It was entered for the Prospective Prize.

Seward.—A seedling from S. V. Smith, Syracuse, N. Y. Bunch of moderate side, say four inches in length. About half those sent had shoulders. Compact, but not much crowded; berry medium to large, round; skin of moderate thickness, in color like the Catawba, or a shade darker; pulp easily bitten through; sweet, juicy, and rich. It has a fragrance resembling that of a ripe pear, like the preceding, but less strong. The berries shake off very badly. Entered for the Prospective Prize.

Montgomery.—Exhibited by J. G. Burrow, of Fishkill, N. Y. Origin not given, but, judging from the appearance, it is largely or wholly foreign. Mr. Burrow states that it is raised by the ton in Dutchess County, though it requires more care than the native varieties. Bunch, seven inches or more in length; compact, shouldered; berry round, green, with a thin bloom, "meaty," not high-flavored.

Duchess was exhibited by R. G. Chase & Co., of Geneva, N. Y., but the specimens were removed before there was time to make a description of them. It is a white grape, with a very "meaty" pulp, from a white seedling of the Concord crossed with Walter.

The mother was from a cross between the Concord and Montgomery.

Niagara.—A plentiful supply of this variety was sent by the Niagara Grape Company, but we see nothing to change in the description made last year. It was originated by Claudius L. Hoag and Benjamin W. Clark, of Lockport, N. Y., and is entered by them for the Prospective Prize.

Prentiss.—This was again exhibited, by T. S. Hubbard, of Fredonia, N. Y. Some of the bunches were larger than those shown last year, and pretty well up to medium size. It is of fine quality and has the characteristics of a good keeper.

All the above-named grapes were shown at the Annual Exhibition, except the Pocklington.

PRIZES AND GRATUITIES AWARDED FOR FRUITS.

January 3.

Gratuity : —

A. S. McIntosh, Glout Morceau Pears, ... $1 00

AZALEA AND ROSE EXHIBITION.

March 18.

Winter Pears.—Any variety, Warren Fenno, Easter Beurre, . $3 00
Second, Warren Fenno, Josephine de Malines, ... 2 00
Winter Apples.—Any variety, Joseph G. Coolidge, Baldwin, . 3 00
Second, William T. Hall, Northern Spy, ... 2 00

Gratuities : —

C. E. Grant, Catillac Pears, ... 1 00
B. G. Smith, Pound Pears, ... 1 00
Robert Manning, Bergamot Parthenay Pears, ... 1 00
Samuel Hartwell, Apples, ... 1 00

March 27.

Gratuity : —

Lemuel Clapp, Seedling Pear, No. 64, ... 1 00

June 5.

Gratuities : —

Leonard W. Weston, Crescent Seedling Strawberries, . . . 1 00
D. L. Milliken, Seedling Strawberries, ... 1 00

June 12.

Gratuities : —

George Hill, Collection of Strawberries, ... 3 00
C. E. Grant, " " 1 00
Charles Garfield, " " 1 00
Aaron D. Capen, Charles Downing Strawberries, ... 1 00
John B. Moore, Hervey Davis, " 1 00

ROSE SHOW.

June 18.

Early Strawberries.—Four quarts, Hovey & Co., Hovey's Seedling, $5 00
Second, B. G. Smith, Sharpless, ... 4 00
Third, John B. Moore, Great American, ... 3 00
Forced Grapes.—Three varieties, Cephas H. Brackett, . . . 7 00
Two bunches of one variety, Cephas H. Brackett, ... 4 00

STRAWBERRY SHOW.

CHANGED FROM JUNE 28, TO JUNE 18.

STRAWBERRIES.—For the best four quarts of Caroline, John B. Moore,	$4 00
Cumberland Triumph, John B. Moore,	4 00
Hervey Davis, " " "	4 00
Sharpless, Warren Heustis,	4 00
For the best two quarts of Caroline, the second prize to C. E. Grant,	1 00
Centennial Favorite, the second prize to John B. Moore,	1 00
Charles Downing, Warren Heustis,	2 00
Second, John B. Moore,	1 00
Cinderella, John B. Moore,	2 00
Col. Cheney, Warren Heustis,	2 00
Crescent Seedling, the second prize to John B. Moore,	1 00
Duchess, John B. Moore,	2 00
Miner's Great Prolific, John B. Moore,	2 00
Monarch of the West, " " "	2 00
Second, M. W. Chadbourne,	1 00
Prouty's Seedling, John B. Moore,	2 00
Sharpless, " " "	2 00
Wilson's Albany, " " "	2 00
Collection, of not less than ten varieties, John B. Moore (17 varieties),	8 00
Fifty berries, of any variety, Warren Heustis,	3 00
CHERRIES.—Two quarts, of any variety, I. P. Langworthy, Knight's Early Black,	2 00
Second, C. E. Grant, Black Heart,	1 00
FOREIGN GRAPES.—Two bunches of any variety, Cephas H. Brackett, Black Hamburg,	3 00
Second, Cephas H. Brackett, Red Frontignan,	2 00
Gratuities: —	
C. E. Grant, Strawberries and Cherries,	1 00
Aaron D. Capen. " "	1 00
M. W. Chadbourne, Strawberries,	1 00
Francis B. Hayes, Figs,	1 00

JUNE 26.

Gratuities: —	
Hovey & Co., eight varieties of French Strawberries,	2 00
E. P. Richardson, two " " Seedling "	1 00
C. E. Grant, six varieties of Cherries,	3 00
C. N. Brackett, "	1 00
Thomas S. Lockwood, "	1 00

JULY 3.

CHERRIES. — Two quarts Black Tartarian, C. E. Grant,	2 00
Second, James Nugent,	1 00

Black Eagle, C. E. Grant,	$2 00
Second, James Nugent,	1 00
Downer's Late, C. E. Grant,	2 00
Second, James Nugent,	1 00
Any other variety, C. E. Grant, Napoleon Bigarreau,	2 00
Second, Warren Fenno, Norfolk,	1 00

Gratuities: —

B. G. Smith, Currants and Raspberries,	2 00
E. W. Wood, "	1 00

JULY 10.

RASPBERRIES.—Two quarts of any variety, Aaron D. Capen, Franconia,	2 00
Second, William Doran & Son,	1 00
CURRANTS.—Four quarts of a red variety, Lemuel Clapp, Versaillaise,	3 00
Second, B. G. Smith,	2 00
Third, E. W. Wood,	1 00
Four quarts of a white variety, John B. Moore, for Dana's White,	3 00
Second, B. G. Smith, French Transparent,	2 00

Gratuities: —

M. W. Chadbourne, Currants,	1 00
C. E. Grant, "	1 00
C. F. Curtis, "	1 00
Warren Heustis, "	1 00
George Craft, "	1 00
Mrs. E. M. Gill, "	1 00
William C. Strong, Gregg Raspberries (Black Cap),	2 00
C. N. Brackett, Cherries,	1 00
Warren Fenno, "	1 00

JULY 17.

RASPBERRIES.—Two quarts of any variety, Mrs. L. P. Weston, Herstine,	2 00
Second, Warren Fenno, Saunders,	1 00
CURRANTS.—Two quarts Dana's Transparent, John B. Moore,	2 00
Second, B. G. Smith,	1 00
Versaillaise, B. G. Smith,	2 00
Second, Warren Fenno,	1 00
Victoria, B. G. Smith,	2 00
Black Naples, Robert Manning,	2 00
Second, B. G. Smith,	1 00
BLACKBERRIES.—Two quarts of any variety, A. S. McIntosh, Dorchester,	2 00
Second, James Nugent,	1 00

Gratuities: —

J. C. Hobbs, Black Hamburg Grapes, ... $3 00
Warren Fenno, Currants and Gooseberries, ... 1 00

JULY 24.

GOOSEBERRIES.—Two quarts of any variety, B. G. Smith, Wellington's Glory, ... 2 00
Second, Horace Eaton, Downing, ... 1 00
BLACKBERRIES.—Two quarts of any variety, A. S. McIntosh, Dorchester, ... 2 00
Second, James Nugent, ... 1 00
PEARS.—Doyenne d' été, Warren Fenno, ... 2 00
Second, B. G. Smith, ... 1 00

Gratuities: —

Warren Fenno, Gooseberries, ... 1 00
Alexander Dickinson, Peaches, ... 1 00
Frederick R. Shattuck, Apricots, ... 1 00
Warren Heustis, Pears, ... 1 00
Aaron D. Capen, Apples, ... 1 00
E. W. Wood, " 1 00
B. G. Smith, Gooseberries, Apples, and Pears, ... 2 00

JULY 31.

PEARS.—Any variety, John McClure, Beurre Giffard, . . . 2 00
Second, Charles Bird, ... 1 00
GOOSEBERRIES.—Two quarts Foreign, B. G. Smith, Bang-Up, . . 2 00
Second, B. G. Smith, Whitesmith, ... 1 00
APRICOTS.—Any variety, Moses Darling, Jr., Moorpark, . . . 2 00
Second, Frederick R. Shuttuck, ... 1 00

Gratuities: —

Samuel Hartwell, Apples, ... 1 00
Warren Heustis, " 1 00
C. N. Brackett. " and Pears, ... 2 00
Warren Fenno, " " 1 00
Horace Eaton, " and Peaches, ... 3 00
Francis B. Hayes, " and Figs, ... 2 00
William E. Coffin, Peaches, ... 1 00

AUGUST 7.

PEARS.—Beurre Giffard, William S. Janvrin, ... 2 00
Second, Warren Fenno, ... 1 00
EARLY APPLES.—Early Harvest, Warren Fenno, ... 2 00
Large Yellow Bough, Warren Heustis, ... 2 00
Second, C. Terry, ... 1 00
Red Astrachan, J. H. Woodford, ... 2 00

Second, Samuel Hartwell,	$1 00
Williams, " "	2 00
Second, B. G. Smith,	1 00
Any other variety, C. N. Brackett, Early Margaret,	2 00
Second, Warren Fenno, Tetofsky,	1 00

Gratuities:—

Aaron D. Capen, Collection of Apples,	1 00
Seth Weston, Apples,	1 00
C. N. Brackett, "	1 00
Warren Fenno, Collection of Apples and Pears,	2 00
B. G. Smith, Peaches and Apples,	1 00
Samuel Hartwell, Peaches,	1 00

August 14.

Pears.—Clapp's Favorite, Warren Heustis,	2 00
Second, Horace Eaton,	1 00
Any other variety, George Frost, Suprême de Quimper,	2 00
Second, Francis B. Hayes, Pinneo,	1 00

Gratuities:—

B. G. Smith, Apples,	1 00
Warren Heustis, "	1 00
Samuel Hartwell, "	1 00
John Cummings, Williams Apples,	1 00
Aaron D. Capen, Sparhawk Apples,	1 00
Francis B. Hayes, Apples and Pears,	1 00
C. N. Brackett, " "	1 00
M. W. Chadbourne, Pears and Peaches,	1 00
Warren Fenno, Pears, Peaches, and Plums,	2 00
Mrs. H. V. Draper, Collection of Plums,	1 00

August 21.

Pears.—Bartlett, John McClure,	2 00
Second, C. N. Brackett,	1 00
Rostiezer, the second prize to Warren Fenno,	1 00
Tyson, A. S. McIntosh,	2 00
Second, Warren Fenno,	1 00
Plums.—Any variety, Thomas S. Lockwood, Lawrence,	2 00
Second, Daniel Tucker, Bradshaw,	1 00
Peaches —Any variety, John B. Moore, Crawford's Early,	2 00
Second, Warren Fenno, Hale's Early,	1 00

Gratuities:—

Horace Partridge, Grapes,	1 00
B. G. Smith, "	1 00
C. E. Grant, "	1 00
John B. Moore, "	1 00

Edwin A. Hall, Plums,	$1 00
Amos Bates, "	1 00
A. M. Davenport, Hale's Early Peaches,	1 00
Francis B. Hayes, Peaches and Figs,	1 00
O. B. Hadwen, Apples,	1 00
John Cummings, "	1 00
Samuel Hartwell, "	1 00
Aaron D. Capen, "	1 00
C. N. Brackett, Sparhawk Apples,	1 00
Francis B. Hayes, Pinneo Pears,	1 00

AUGUST 28.

APPLES.—Any variety, Samuel Hartwell, Gravenstein,	2 00
Second, L. W. Weston, Foundling,	1 00
PEARS.—Bartlett, C. N. Brackett,	2 00
Second, Warren Fenno,	1 00
Any other variety, C. N. Brackett, Doyenne Boussock,	2 00
Second, Warren Fenno, Andrews,	1 00
PLUMS.—Collection of not less than four varieties, Horace Eaton,	3 00
Any one variety, Thomas S. Lockwood, Lawrence's Favorite,	2 00
PEACHES.—Collection of not less than four varieties, Francis B. Hayes,	3 00
NATIVE GRAPES.—Six bunches of any early variety, J. W. Talbot, Delaware,	2 00
Second, J. W. Talbot, Cottage,	1 00

Gratuities:—

O. B. Hadwen, Apples,	1 00
John Cummings, "	1 00
Samuel Hartwell, "	1 00
John Cummings, Pears,	1 00
Howard Gannett, " and Peaches,	2 00
Mrs. W. Emery, Plums,	1 00
John C. Hovey, "	1 00
George W. Stevens, Peaches,	1 00
A. M. Davenport, "	1 00
Samuel Hartwell, "	1 00
John B. Moore "	1 00
Warren Fenno, Nectarines,	1 00

SEPTEMBER 4.

APPLES.—Foundling, L. W. Weston,	2 00
Second, Samuel Hartwell,	1 00
Gravenstein, Josiah Crosby,	2 00
Second, Samuel Hartwell,	1 00
Porter, John Cummings,	2 00
Second, Samuel Hartwell,	1 00

Any other variety, C. N. Brackett, Red and Green Sweet,	$2 00
Second, John Cummings, Garden Royal,	1 00
Pears.—Andrews, Benjamin F. Hunt,	2 00
Second, Horace Partridge,	1 00
Doyenne Boussock, C. N. Brackett,	2 00
Second, E. W. Wood,	1 00
Any other variety, Horace Partridge, Flemish Beauty,	2 00
Second, Warren Fenno, " "	1 00
Native Grapes.—Six bunches of Delaware, Joseph S. Chase,	2 00
Second, Horace Eaton,	1 00
Hartford Prolific, Augustus Torrey,	2 00
Second, M. Darling, Jr.,	1 00
Moore's Early, John B. Moore,	2 00
Any other variety, Horace Eaton, Creveling,	2 00
Second, N. B. White, Norfolk Muscat,	1 00
Peaches.—Any variety, John B. Moore, Crawford's Early,	2 00
Second, Samuel Hartwell, " "	1 00

Gratuities:—

A. D. Capen, Pears and Apples,	1 00
Howard Gannett, Pears and Peaches,	1 00
Charles Garfield, Grapes,	1 00
John L. Gardner, Peaches,	1 00
Francis Payer, "	1 00
E. W. Capen, "	1 00
M. W. Chadbourne, "	1 00
Samuel Hartwell, "	1 00
Warren Fenno, Plums and Nectarines,	1 00

ANNUAL EXHIBITION.

September 14, 15, 16, and 17.

Special Prizes.

Twelve Gravenstein Apples, Josiah Crosby,	$5 00
Twelve Bartlett Pears, Charles F. Curtis,	5 00
Twelve Peaches of any variety, Samuel Hartwell,	5 00
Twelve Bunches of Native Grapes, John B. Moore,	5 00

Regular Prizes.

Apples.—Baldwin, Samuel Hartwell,	2 00
Second, John Cummings,	1 00
Danvers Winter Sweet, John Cummings,	2 00
Second, C. N. Brackett,	1 00
Cogswell, O. B. Hadwen,	2 00

Dutch Codlin, B. G. Smith,	$2 00
Second, A. S. McIntosh,	1 00
Fall Orange or Holden Pippin, O. B. Hadwen,	2 00
Second, Edwin Fletcher,	1 00
Fameuse, " "	2 00
Second, B. G. Smith,	1 00
Foundling, Samuel Hartwell,	2 00
Second, L. W. Weston,	1 00
Garden Royal, J. C. McNeal,	2 00
Second, John Cummings,	1 00
Golden Russet, L. W. Weston,	2 00
Second, Warren Fenno,	1 00
Gravenstein, Samuel Hartwell,	2 00
Second, John Cummings,	1 00
Hubbardston Nonsuch, John Cummings,	2 00
Second, C. N. Brackett,	1 00
Hunt Russet, Samuel Hartwell,	2 00
Second, John Cummings,	1 00
King of Tompkins County, William C. Eustis,	2 00
Second, John Fletcher,	1 00
Lady's Sweet, C. N. Brackett,	2 00
Leicester Sweet, O. B. Hadwen,	2 00
Lyscom, " "	2 00
Second, John Cummings,	1 00
Maiden's Blush, John Cummings,	2 00
Second, Warren Fenno,	1 00
Mother, Edwin Fletcher,	2 00
Second, John Cummings,	1 00
Northern Spy, William C. Eustis,	2 00
Second, John B. Moore,	1 00
Porter, George Hill,	2 00
Second, H. M. Wiswall,	1 00
Pumpkin Sweet, Mrs. Susan Smith,	2 00
Second, George W. Stevens,	1 00
Rhode Island Greening, A. D. Capen,	2 00
Second, C. N. Brackett,	1 00
Roxbury Russet, John L. D'Wolf,	2 00
Second, William C. Eustis,	1 00
Talman's Sweet, Josiah Crosby,	2 00
Second, J. T. Foster,	1 00
Washington Strawberry, Warren Fenno,	2 00
CRAB APPLES.—Hyslop, John B. Moore,	2 00
Transcendent, John B. Moore,	2 00
Second, Horace Eaton,	1 00
Any other variety, B. G. Smith, Peach Crab,	2 00
PEARS.—Bartlett, Mrs. Mary Langmaid,	2 00
Second, Warren Heustis,	1 00

Belle Lucrative, Isaac Oliver,	$2 00
Second, John C. Park,	1 00
Beurre d'Anjou, Mrs. Mary Langmaid,	2 00
Second, Mrs. M. T. Goddard,	1 00
Beurre Bosc, William P. Walker,	2 00
Second, Warren Fenno,	1 00
Beurre Clairgeau, Charles P. Curtis,	2 00
Second, William T. Hall,	1 00
Beurre Diel, Mrs. H. P. Kendrick,	2 00
Second, Walker & Co.,	1 00
Beurre Hardy, Walker & Co.,	2 00
Second, Warren Fenno,	1 00
Beurre Langelier, Marshall P. Wilder,	2 00
Second, S. G. Damon,	1 00
Beurre Superfin, Lewis Slack,	2 00
Second, S. G. Damon,	1 00
Dana's Hovey, Mrs. Jesse Haley,	2 00
Second, S. G. Damon,	1 00
Doyenne Boussock, E. W. Wood,	2 00
Second, Marshall P. Wilder,	1 00
Doyenne du Comice, Eben Snow,	2 00
Second, Warren Fenno,	1 00
Duchesse d'Angouleme, W. S. Janvrin,	2 00
Second, Alexander Dickinson,	1 00
Fulton, John C. Park,	2 00
Second, John L. Bird,	1 00
Glout Morceau, William P. Walker,	2 00
Second, John L. D'Wolf,	1 00
Goodale, C. E. Grant,	2 00
Second, Warren Fenno,	1 00
Howell, W. S. Janvrin,	2 00
Second, B. G. Smith,	1 00
Lawrence, John McClure,	2 00
Second, A. S. McIntosh,	1 00
Louise Bonne of Jersey, William T. Hall,	2 00
Second, Warren Fenno,	1 00
Marie Louise, S. G. Damon,	2 00
Second, Warren Fenno,	1 00
Merriam, John L. D'Wolf,	2 00
Second, A. S. McIntosh,	1 00
Mount Vernon, Walker & Co.,	2 00
Second, Charles Bird,	1 00
Onondaga, W. P. Walker,	2 00
Second, A. McDermott,	1 00
Paradis d'Automne, C. N. Brackett,	2 00
Second, Marshall P. Wilder,	1 00
Pratt, " " "	2 00

Seckel, Horace Eaton,	$2 00
Second, John L. Bird,	1 00
Sheldon, C. F. Curtis.	2 00
Second, Horace Eaton,	1 00
Souvenir du Congrès, Warren Fenno,	2 00
Second, Marshall P. Wilder,	1 00
St. Michael Archangel, Walker & Co.,	2 00
Second, Warren Fenno,	1 00
Urbaniste, Mrs. Mary Langmaid,	2 00
Second, John L. Bird,	1 00
Vicar of Winkfield, W. P. Walker,	2 00
Second, Edwin A. Hall,	1 00
Winter Nelis, John L. Bird,	2 00
Second, John C. Park,	1 00
Peaches.—Any one variety, Samuel Hartwell, Stump the World,	2 00
Second, L. W. Weston, Crawford's Late,	1 00
Peaches.—Orchard House Culture, John Falconer, Crawford's Late,	4 00
Nectarines.—Any variety, Alonzo R. James,	2 00
Second, John Falconer,	1 00
Plums.—Not less than four varieties, Horace Eaton,	4 00
Second, John B. Moore,	3 00
Any one variety, J. L. Nicolson, Bradshaw,	2 00
Second, B. G. Smith, Coe's Golden Drop,	1 00
Grapes.—Six bunches of Brighton, Joseph S. Chase,	2 00
Second, Hovey & Co.,	1 00
Concord, Joseph S. Chase,	2 00
Second, William Doran & Son,	1 00
Delaware, Joseph S. Chase,	2 00
Second, E Snow,	1 00
Hartford Prolific, Moses Darling, Jr.,	2 00
Second, S. G. Damon,	1 00
Massasoit, Mrs. E. M. Gill,	2 00
Second, Joseph S. Chase,	1 00
Moore's Early, John B. Moore,	2 00
Second, B. G. Smith,	1 00
Wilder, J. W. Talbot,	2 00
Second, Joseph S. Chase,	1 00
Any other variety, C. J. Copley, Lindley,	2 00
Second, J. W. Talbot, Norwood,	1 00
Foreign Grapes.—Six varieties, two bunches each, A. W. Nickerson,	10 00
Second, B. G. Smith,	8 00
Third, E. H. Luke,	4 00
Four varieties, two bunches each, H. L. Higginson,	8 00
Two " " " " A. W. Nickerson,	4 00
Second, John L. Gardner,	3 00
Third, E. H. Luke,	2 00
Two bunches of any Black Grape, John L. Gardner, Black Hamburg,	4 00

Second, H. L. Higginson, Wilmot's Black Hamburg,	$3 00
Third, C. D. Kingman, " " "	2 00
Two bunches of any White Grape, John L. Gardner, Muscat of Alexandria,	4 00
Second, M. H. Simpson, Buckland Sweetwater,	3 00
Third, John Falconer, White Tokay,	2 00

Gratuities:—

Dr. G. G. Kennedy, Apples,	3 00
C. N. Brackett, "	2 00
Warren Fenno, "	1 00
John B. Moore, "	1 00
Sidney Lawrence, "	1 00
Samuel Hartwell, " and Pears,	2 00
John Cummings, " "	2 00
B. G. Smith, " "	2 00
J. W. Talbot, President Clark Pears,	1 00
Marshall P. Wilder, Pears,	3 00
M. W. Chadbourne, "	3 00
Francis B. Hayes, "	2 00
C. E. Grant, "	2 00
T. M. Davis, "	2 00
Charles Bird, "	1 00
John B. Moore, "	1 00
P. Ames, Peaches,	2 00
C. H. Parker, "	1 00
George Hill, "	1 00
Moses Darling, Jr., "	1 00
J. L. D. Sullivan, "	1 00
J. H. Ricketts, Mrs. Brett Peaches (fine),	1 00
R. G. Chase & Co., Duchess Grapes,	1 00
B. G. Smith, Native Grapes,	2 00
C. J. Copley, " "	3 00
J. H. Ricketts, " "	2 00
M. P. Wilder, " "	1 00
C. E. Grant, " "	1 00

SEPTEMBER 25.

Gratuities: —

George S. Harwood, Sheldon, Seckel, and Louise Bonne of Jersey Pears (very fine),	3 00
Barnabas Davis, Black Hamburg Grapes,	1 00
N. D. Harrington, Crawford's Late Peaches,	1 00

OCTOBER 2.

PEARS.—Beurre Bosc, Charles F. Curtis,	2 00
Second, A. A. Smith,	1 00
Beurre Clairgeau, Charles F. Curtis,	2 00

Second, Mrs. Mary Langmaid,	$1 00
Beurre Diel, Mrs. H. P. Kendrick,	2 00
Second, Edward Sparhawk,	1 00
Beurre Superfin, Warren Fenno,	2 00
Doyenne du Comice, John McClure,	2 00
Second, Warren Fenno,	1 00
Duchesse d'Angouleme, Mrs. H. P. Kendrick,	2 00
Second, W. S. Janvrin,	1 00
Louise Bonne of Jersey, John McClure,	2 00
Second, Warren Fenno,	1 00
Sheldon, C. F. Curtis,	2 00
Second, John McClure,	1 00
Urbaniste, Samuel Downer,	2 00
Second, S. G. Damon,	1 00
Apples.—Fall Orange or Holden Pippin, Charles N. Brackett,	2 00
Second, Edward Sumner,	1 00
Gravenstein, Samuel Hartwell,	2 00
Second, John Cummings,	1 00
Mother, " "	2 00
Second, C. Terry,	1 00
Porter, S. G. Damon,	2 00
Second, A. S. McIntosh,	1 00
Any other variety, W. C. Eustis, Tompkins County King,	2 00
Second, Warren Fenno, Washington Strawberry,	1 00
Quinces.—Any variety, Joseph S. Chase, Orange,	2 00
Second, B. G. Smith, Rea's Mammoth,	1 00
Grapes.—Concord, Joseph S. Chase,	2 00
Second, Horace Eaton,	1 00
Delaware, Joseph S. Chase,	2 00
Second, C. E. Grant,	1 00
Diana, S. G. Damon,	2 00
Second, Joseph S. Chase,	1 00
Isabella, Moses Darling, Jr.,	2 00
Second, T. M. Davis,	1 00
Massasoit, Joseph S. Chase,	2 00
Any other variety, Horace Eaton, Eaton's Seedling,	2 00
Second, Horace Eaton, Worden,	1 00
Foreign Grapes.—Two bunches of any variety, B. G. Smith, Muscat Hamburg,	3 00
Second, B. G. Smith, Golden Hamburg,	2 00

Gratuities :—

I. P. Langworthy, White Doyenne Pears (fine),	1 00
A. D. Capen, Apples and Pears,	1 00
C. E. Grant, Pears and Grapes,	2 00
B. G. Smith, Plums and "	1 00
M. Stoddard, Seedling Peaches (fine),	1 00

October 16.

Gratuities:—

Mrs. H. V. Draper, Pears and Grapes,	$1 00
Franklin Patch, Jacobs's Sweet Apples,	1 00

November 10.

Pears.—Beurre d' Anjou, Warren Fenno,	2 00
Second, Mrs. Mary Langmaid,	1 00
Dana's Hovey, Mrs. Jesse Haley,	2 00
Second, Mrs. H. P. Kendrick,	1 00
Doyenne du Comice, Warren Fenno,	2 00
Josephine de Malines, " "	2 00
Second, B G. Smith,	1 00
Lawrence, John McClure,	2 00
Second, Warren Fenno,	1 00
Vicar of Winkfield, John McClure,	2 00
Second, Amos Bates,	1 00
Winter Nelis, John L. Bird,	2 00
Second, T. M. Davis,	1 00
Any other variety, A. S. McIntosh, Glout Morceau,	2 00
Second, Amos Bates, Mount Vernon,	1 00

French Premiums.

Apples.—Baldwin, J. H. Norcross,	2 00
Second, John Cummings,	1 00
Danvers Winter Sweet, Edward Sumner,	2 00
Second, John Cummings,	1 00
Hubbardston Nonsuch, M. W. Chadbourne,	2 00
Second, W. C. Eustis,	1 00
Hunt Russet, Samuel Hartwell,	2 00
Second, John Cummings,	1 00
King of Tompkins County, Edward Sumner,	2 00
Second, William C. Eustis,	1 00
Lady's Sweet, C. N. Brackett,	2 00
Second, Horace Eaton,	1 00
Northern Spy, W. C. Eustis,	2 00
Second, C. A. Cripps,	1 00
Rhode Island Greening, C. N. Brackett,	2 00
Second, Horace Eaton,	1 00
Roxbury Russet, W. C. Eustis,	2 00
Second, Warren Fenno,	1 00
Talman's Sweet, Josiah Crosby,	2 00
Second, J. T. Foster,	1 00

Gratuities:—

Horace Eaton,	Apples,	$2 00
John Cummings,	"	2 00
O. B. Hadwen,	"	1 00
B. G. Smith,	"	1 00
Samuel Hartwell,	"	1 00
C. E. Grant,	Pears,	3 00
Warren Fenno,	"	2 00
M. W. Chadbourne,	"	1 00
Mrs. Gates,	"	1 00

First Class Certificates of Merit.

Annual Exhibition, September 14–17. Vivus W. Smith, Syracuse, N. Y., Seedling Grapes.

Annual Exhibition. Niagara Grape Company, Lockport, N. Y., Niagara Grapes.

Annual Exhibition. J. G. Burrow, Fishkill, N. Y., Jefferson Grapes.

" " John B. Moore, Francis B. Hayes Grapes.

October 2. John Pocklington, Sandy Hill, N. Y., Pocklington Grapes.

" J. W. Talbot, Norwood Grapes.

REPORT

OF THE

COMMITTEE ON VEGETABLES,

FOR THE YEAR 1880.

By CHARLES N. BRACKETT, Chairman.

A review of the records of the exhibition season, for the year now closing, affords a very encouraging manifestation of progress in this department throughout the year.

The products of the soil never fail to respond to the enterprise and industry of those who remember the old-time promise, that "seed time and harvest shall never fail." A succession of bountiful crops, and an unusual demand for them both at home and abroad, has in a great measure tended to quicken enterprise, and encourage labor with an adequate reward.

The improvement noticed in our exhibitions, as compared with the previous year, is perhaps in part due to a favorable season. No one, however, at all familiar with the merits of the case, will, we think, question the fact that the Society is largely, if not mainly, indebted for the wonderful change that has taken place for the better to the return to more frequent exhibitions, and the offer of *prizes* at those exhibitions, instead of gratuities, as was the case last year.

In former reports, your Committee have had occasion to regret the apparent falling off in interest in forcing vegetables, and the lack of specimens on our tables during the winter and early spring months. They are pleased to be able to report some slight improvement in this direction the past year.

Your Committee are still of the opinion that these objects constitute an interesting and valuable feature, and are a great addition to our winter shows, and worthy of encouragement by the

Society. From the commencement of the year until the middle of March, no prizes are offered for vegetables grown under glass. Your Committee have, for a long time, felt that this important interest has been neglected. We have no doubt that, if suitable prizes were offered, a lively competition would spring up among our enterprising market gardeners and others, and, as a result, our tables would be filled with the rarest and choicest specimens of their skill.

The cultivation of the usual varieties of vegetables under glass commends itself to all of us, as a means of obtaining what may be considered a luxury, as well as an article of diet conducive to health. They are wholesome and nutritious articles of food, needed for the preservation of health and prevention of disease, and, as such, their culture should be considered a subject of much importance, and worthy of all the labor and patience required to produce them. In view of their importance, your Committee would respectfully suggest that, another year, the income accruing from the Whitcomb fund be devoted to this purpose.

During the months of January, February, and March, we were indebted to the following contributors for very fine specimens of the vegetables mentioned:

January 3 and February 14, to Cephas H. Brackett, for excellent specimens of White Spine cucumbers, mushrooms, and tomatoes. January 31 and March 6, J. B. Moore showed dishes of the finest and best grown mushrooms ever seen on our tables, which attracted the particular attention of all interested in the cultivation of this favorite epicurean fungus vegetable. February 14, W. C. Strong, tomatoes. February 28, Josiah Crosby, specimens of very large and well-grown dandelions. March 6, Walter Russell, two varieties of radishes, — Long Scarlet, and French Breakfast; and George F. Stone, fine specimens of Tennisball lettuce. At the opening exhibition, March 18, this department was well represented, and again at the Rose Show, June 18. The various specimens and varieties offered for prizes were well grown, and competition was unusually brisk. May 8, Aaron Low showed specimens of his Hybrid Turban squash, in an excellent state of preservation.

Throughout the season the exhibitions have generally been good, and in marked contrast with those of the previous year. We might particularize, but it would only be a repetition, and

make our report too long, as the annexed list of prizes and gratuities awarded by your Committee covers the whole ground.

The Schedule of Prizes offered the past season has proved popular, mainly, we are inclined to think, on account of the offering of fixed prizes at each weekly exhibition. By this arrangement, the hall has always presented an appearance creditable alike to the Society and the exhibitors.

The Annual Exhibition was, in all respects, a good one. The show of Potatoes at this exhibition, for beauty, size, and smoothness of growth, has rarely, if ever, been excelled. Owing to favorable circumstances, this crop, the past season, has been one of unusual excellence. The Colorado beetle, it is true, has in some instances been more or less destructive, but by a timely application of Paris green, properly and persistently applied, the ravages of this pest can be controlled. Prominent among the different varieties on exhibition at this show, we may mention the following: Early Rose, Beauty of Hebron, Snowflake, Clarke's No. 1, Mammoth Pearl, King of the Earlies, Early Ohio, Dunmore, Burbank, St. Patrick, and Early Vermont.

E. S. Brownell, of Essex Junction, Vt., exhibited, and entered for the Society's Prospective Prize for the best Seedling Late Potato, a new seedling, called the Pride of America, raised by him several years since, and shown here for the first time at the Annual Exhibition. The following is Mr. Brownell's description, which we append for future reference:

"It was raised from a seed-ball of the Eureka, fertilized with the pollen of the White Peach Blow, and combines the wonderful productiveness and excellent keeping qualities of the former, with all the well-known qualities of the latter.

"In appearance it closely resembles the well-known Snowflake, and may be easily mistaken for that favorite variety. It ripens a few days later, and has the advantage over that variety of being adapted to a greater variety of soils, being much more productive, growing to a larger size, and producing but a very few small tubers, nearly all being of a good marketable size; it is a most excellent keeper, and, so far, has shown no signs of disease. In quality it is fully equal to the Snowflake; flesh exceedingly fine grained and of snowy whiteness either baked or boiled; cooks through quickly and evenly, dry and floury; has no hard centre or core; as a table variety is absolutely without a fault. In habit of growth

the vines are of medium length, well covered with a light green, stocky foliage; the tubers grow compactly in the hill, so that the crop can be easily harvested. It is an excellent keeper, and retains all its good qualities throughout the entire season."

As evidence of its good keeping qualities, Mr. Brownell also exhibited specimens of this variety grown in 1879, which had been kept in the cellar with ordinary care, and which were in an excellent state of preservation, and in good eating condition. We regard this potato as a very promising one, and hope to see it thoroughly tested here the coming season. At the Annual Show there were upwards of forty dishes of potatoes on the tables, comprising nearly all the leading varieties, and constituting a prominent and interesting feature of that exhibition.

The amount appropriated for prizes and gratuities for vegetables was	$500.00
Income from the Whitcomb fund, ...	30.00
Total, ...	$530.00
Amount awarded in prizes and gratuities, . .	527.00
Leaving an unexpended balance of . . .	$3.00

The list of prizes and gratuities awarded by your Committee is annexed.

All of which is respectfully submitted,

C. N. Brackett,
Walter Russell,
Josiah Crosby,
George W. Pierce,
Samuel Hartwell,
C. E. Grant,
M. W. Chadbourne,
Committee on Vegetables.

PRIZES AND GRATUITIES FOR VEGETABLES.

JANUARY 3.

Gratuity :—

C. H. Brackett, Cucumbers and Tomatoes, ... $2 00

JANUARY 31.

Gratuity :—

J. B. Moore, Mushrooms, ... 2 00

FEBRUARY 14.

Gratuities :—

W. C. Strong, Tomatoes, ... 1 00
C. H. Brackett, Mushrooms, Cucumbers, and Tomatoes, . . 2 00

FEBRUARY 28.

Gratuity :—

Josiah Crosby, Dandelions, ... 1 00

MARCH 6.

Gratuities :—

J. B. Moore, Mushrooms, ... 1 00
Walter Russell, Radishes, ... 1 00
George F. Stone, Lettuce, ... 1 00

AZALEA AND ROSE EXHIBITION.

MARCH 18.

LETTUCE.—Four heads Tennisball, J. B. Moore, ... $3 00
Second, J. Crosby, ... 2 00
DANDELIONS.—Peck, J. G. Coolidge, ... 2 00
PARSLEY.—Two quarts, J. G. Coolidge, ... 2 00
CUCUMBERS.—Pair of White Spine, C. H. Brackett, . . . 3 00

Gratuities :—

C. H. Brackett, Mushrooms and Tomatoes, ... 2 00
J. B. Moore, Mushrooms, ... 2 00
James Nugent, Rhubarb, ... 1 00
Samuel Hartwell, Onions, ... 1 00

April 3.

Gratuities:—

B. N. Adams, Lettuce and Mint,	$2 00
George W. Pierce, Lettuce,	1 00

April 17.

Gratuity:—

Charles Garfield, Lettuce,	1 00

May 1.

Gratuity:—

Charles Garfield, Lettuce,	1 00

May 8.

Gratuities:—

M. W. Chadbourne, Rhubarb, and Hanson Lettuce,	2 00
B. D. Capen, Rhubarb,	1 00
Samuel Hartwell, Asparagus,	1 00
Walter Russell, Radishes,	1 00

May 22.

Gratuities:—

E. W. Wood, Cucumbers,	1 00
Samuel Hartwell, Asparagus,	1 00

May 29.

Gratuity:—

Josiah Crosby, three varieties of Lettuce,	1 00

June 5.

Carrots.—Twelve Short Scarlet, J. Crosby,	2 00
Radishes.—Four bunches Long Scarlet, Walter Russell,	2 00
Second, J. Crosby,	1 00
Asparagus.—Four bunches, J. B. Moore,	2 00
Second, Samuel Hartwell,	1 00
Cucumbers.—Pair, E. W. Wood,	2 00
Second, J. Crosby,	1 00
Lettuce.—Four heads, J. B. Moore,	2 00
Second, Walter Russell,	1 00
Rhubarb.—Twelve stalks, S. Hartwell,	2 00
Second, M. W. Chadbourne,	1 00

Gratuities:—

Walter Russell, Onions,	1 00
L. W. Weston, Asparagus,	1 00
A. T. Brown, Carrots,	1 00
Josiah Crosby, Beets,	1 00
Francis B. Hayes, three varieties of Cucumbers,	1 00

JUNE 12.

Gratuities:—

C. E. Grant, Peas,	$1 00
Samuel G. Stone, Peas,	1 00

ROSE EXHIBITION.

JUNE 18.

BEETS —Twelve Turnip Rooted, W. Russell,	$2 00
Twelve Egyptian, Josiah Crosby,	2 00
CARROTS.—Twelve Intermediate, J. Crosby,	2 00
ONIONS.—Twelve, Walter Russell,	2 00
Second, Josiah Crosby,	1 00
CUCUMBERS.—Pair of White Spine, George W. Pierce,	2 00
Second, Josiah Crosby,	1 00
CABBAGES.—Four, J. Crosby, Henderson's Early,	2 00
Second, " " Jersey Wakefield,	1 00
LETTUCE.—Four heads, J. Crosby,	2 00
Second, George W. Pierce,	1 00
PEAS.—Peck, S. Hartwell, Advancer,	2 00
Second, Samuel G. Stone, Alpha,	1 00

Gratuities:—

C. H. Brackett, Tomatoes,	1 00
James Bard, Fig Tomatoes,	1 00
M. W. Chadbourne, Beauty of Hebron Potatoes,	2 00
C. N. Brackett, Hanson Lettuce,	1 00
J. B. Moore, Lettuce,	1 00
Walter Russell, Radishes,	1 00

JUNE 26.

Gratuities:—

Josiah Crosby, Collection,	2 00
Samuel G. Stone, String Beans,	2 00
Cephas H. Brackett, Tomatoes,	1 00

JULY 3.

ONIONS.—Twelve specimens, J. Crosby,	2 00
Second, W. Russell,	1 00
SQUASHES.—Four Long Warted Summer, W. Russell,	2 00
Second, J. Crosby,	1 00
CABBAGES—Four, Walter Russell,	2 00
Second, J. Crosby,	1 00
CRANBERRY BEANS.—Peck, Walter Russell,	2 00
Second, Samuel G. Stone,	1 00
PEAS.—Peck, Samuel G. Stone, Champion,	2 00
Second, " " " Advancer,	1 00

Gratuities:—

E. W. Wood, Tomatoes,	$1 00
Josiah Crosby, Wakefield Cabbages,	1 00
Francis B. Hayes, two varieties of Cucumbers,	1 00
Walter Russell, Wax Beans,	1 00
Samuel G. Stone, " "	1 00

JULY 10.

POTATOES.—Peck, M. W. Chadbourne, Beauty of Hebron,	3 00
Second, C. N. Brackett, Clark's No. 1,	2 00
Third, M. W. Chadbourne, Early Rose,	1 00

Gratuities:—

Samuel G. Stone, Collection,	2 00
J. Crosby, "	2 00

JULY 17.

SQUASHES.—Four Marrow, J. Crosby,	3 00
SWEET CORN.—Twelve ears, S. G. Stone,	3 00
Second, C. E. Grant,	2 00
TOMATOES.—Twelve specimens, C. N. Brackett, Emery,	3 00
Second, C. N. Brackett, Gen. Grant,	2 00

Gratuities:—

Josiah Crosby, Onions and Squashes,	2 00
Alexander Anderson, Early Rose Potatoes,	1 00
W. H. Spooner, Beans,	1 00
S. G. Stone, Collection,	1 00

JULY 24.

SWEET CORN.—Twelve ears, M. W. Chadbourne,	3 00
Second, Josiah Crosby,	2 00
Third, S. G. Stone,	1 00
TOMATOES.—Twelve, C. N. Brackett, Emery,	3 00
Second, " " Gen. Grant,	2 00
Third, " " Paragon,	1 00

Gratuities:—

J. B. Moore, Collection of Tomatoes,	1 00
Samuel G. Stone, Beans,	1 00
Samuel Hartwell, Sweet Corn,	1 00
C. E. Grant, " "	1 00

JULY 31.

SQUASHES.—Four Marrow, J. Crosby,	2 00
SWEET CORN.—Twelve ears, Samuel Hartwell,	2 00
Second, L. W. Weston,	1 00
TOMATOES.—Twelve Gen. Grant, C. N. Brackett,	2 00
Twelve Emery, " "	2 00
Any other variety, " " Acme,	2 00

Gratuities: —

Franeis B. Hayes, Turnips,	$1 00
Walter Russell, Egg Plant,	2 00
C. E. Grant, Corn,	1 00
M. W. Chadbourne, Potatoes,	1 00
J. Crosby, Early Rose Potatoes,	1 00

AUGUST 7.

EGG PLANT.—Four Large Round Purple, J. B. Moore,	3 00
Seeond, J. Crosby,	2 00
Third, Walter Russell,	1 00

Gratuities: —

M. W. Chadbourne, Collection,	2 00
C. N. Brackett, "	2 00
Samuel Hartwell, Sweet Corn,	1 00
Mrs. E. M. Gill, Beans,	1 00
Samuel G. Stone, Tomatoes,	1 00

AUGUST 14.

EGG PLANT.—Four Large Round Purple, J. B. Moore,	2 00
Seeond, Josiah Crosby,	1 00
MUSKMELONS.—Four, Samuel Hartwell,	2 00
GREENFLESH.—Four, C. F. Curtis,	2 00

Gratuities: —

M. W. Chadbourne, Sweet Corn,	1 00
Mrs. E. M. Gill, " "	1 00
J. B. Moore, Aeme Tomatoes,	1 00
J. K. Bennett, Squashes, growth of 1879,	1 00
Samuel Hartwell, Colleetion,	2 00
C. E. Grant, "	2 00
C. N. Braekett, "	2 00
Samuel G. Stone, "	1 00

AUGUST 21.

POTATOES.—Peek, John Cummings, Early Rose,	2 00
BEANS.—Two quarts Lima, B. G. Smith,	3 00
Seeond, Samuel Hartwell,	2 00
Third, Samuel G. Stone,	1 00
PEPPERS.—Twelve, J. Crosby,	3 00
Seeond, C. N. Brackett,	2 00

Gratuities: —

Mrs. E. M. Gill, Tomatoes,	1 00
J. B. Moore, Acme Tomatoes,	1 00

M. W. Chadbourne, Collection, ... $1 00
Samuel Hartwell, " 1 00
C. N. Brackett, " 1 00
J. Cummings, " 1 00
S. G. Stone, " 1 00
C. E. Grant, " 1 00

August 28.

Watermelons.—Pair, Samuel Hartwell, ... 3 00
Second, Samuel Hartwell, ... 2 00
Greenflesh Melons.—Four, George F. Curtis, ... 3 00
Second, Samuel Hartwell, ... 2 00

Gratuities:—

John Cummings, Collection, ... 3 00
Samuel G. Stone, " 1 00
Samuel Hartwell, " 1 00
C. N. Brackett, " 1 00

September 4.

Cauliflowers.—Four, John Cummings, ... 3 00
Second, J. L. Gardner, ... 2 00
Celery.—Four roots, Alfred Tufts, ... 3 00
Second, Josiah Crosby, Boston Market, ... 2 00
Third, " " Golden Heart, ... 1 00

Gratuities:—

Samuel Hartwell, Collection, ... 1 00
Samuel G. Stone, " 1 00

ANNUAL EXHIBITION.

September 14, 15, 16, and 17.

Beets. — Twelve Turnip Rooted, G. F. Stone, ... $3 00
Second, Josiah Crosby, ... 2 00
Third, Walter Russell, ... 1 00
Carrots. — Twelve Long Orange, J. L. D'Wolf, ... 3 00
Second, Josiah Crosby, ... 2 00
Third, Walter Russell, ... 1 00
Intermediate, Josiah Crosby, ... 3 00
Second, J. Cummings, ... 2 00
Third, Walter Russell, ... 1 00
Parsnips.—Twelve Long, J. L. D'Wolf, ... 3 00
Second, M. W. Chadbourne, ... 2 00
Third, Walter Russell, ... 1 00

POTATOES.—Four varieties, one peck each, C. N. Brackett,	$4 00
Second, Aaron Low,	3 00
Third, Mrs. M. T. Goddard,	2 00
Early Rose, John Cummings,	3 00
Second, A. T. Brown,	2 00
Third, C. Terry,	1 00
Snowflake, John L. D'Wolf,	3 00
Second, Mrs. Mary T. Goddard,	2 00
Any other variety, C. N. Brackett, Mammoth Pearl,	3 00
Second, J. B. Moore, Mammoth Pearl,	2 00
Third, " " Clark's No. 1,	1 00
SALSIFY.—Twelve specimens, Benjamin G. Smith,	3 00
Second, M. W. Chadbourne,	2 00
Third, Josiah Crosby,	1 00
TURNIPS.—Twelve Flat, W. Russell,	3 00
Second, George F. Stone,	2 00
Third, J. Cummings,	1 00
Twelve Swedish, Mrs. M. T. Goddard,	3 00
Second, A. T. Brown,	2 00
ONIONS.—Peck of Danvers Yellow, J. Crosby,	3 00
Second, George Hill,	2 00
Third, John Cummings,	1 00
Red, " "	3 00
Second, George Hill,	2 00
Third, Walter Russell,	1 00
Portugal, " "	3 00
Second, J. Crosby,	2 00
Third, J. Cummings,	1 00
GREENFLESH MELONS.—Four, George W. Pierce,	3 00
Second, C. E. Calder,	2 00
WATERMELONS.—Two, I. P. Dickinson, Brown Solid,	3 00
Second, " " Excelsior,	2 00
Third, " " Black Italian,	1 00
SQUASHES.—Four Canada, Mrs. M. T. Goddard,	3 00
Second, C. E. Calder,	2 00
Third, Warren Fenno,	1 00
Hubbard, Walter Russell,	3 00
Second, George Hill,	2 00
Third, David Warren,	1 00
Marblehead, John Cummings,	3 00
Second, Walter Russell,	2 00
Marrow, George Hill,	3 00
Second, Walter Russell,	2 00
Third, J. Cummings,	1 00
Turban, " "	3 00
Second, George Hill,	2 00
Third, Walter Russell,	1 00

Cabbages.—Three Drumhead, Mrs. M. T. Goddard,	$3 00
Second, John Cummings,	2 00
Red. " "	3 00
Savoy, " "	3 00
Second, Walter Russell,	2 00
Third, Mrs. M. T. Goddard,	1 00
Cauliflowers.—Four, John Cummings,	3 00
Second, J. L Gardner,	2 00
Celery.—Four roots, Alfred Tufts,	3 00
Second, Josiah Crosby,	2 00
Third, C. W. Ross,	1 00
Endive.—Four specimens, J. L. Gardner,	2 00
Horseradish.—Six roots, Walter Russell,	3 00
Lima Beans.—Two quarts, Benjamin G. Smith,	3 00
Second, Samuel G. Stone,	2 00
Third, C. E. Grant,	1 00
Corn.—Sweet, twelve ears, J. Cummings,	3 00
Second, George Craft,	2 00
Third, A. T. Brown,	1 00
Yellow or Field, twenty-five ears, traced, Mrs. M. T. Goddard,	3 00
Second, C. N. Brackett,	2 00
Egg Plant.—Four Round Purple, Walter Russell,	3 00
Second, John B. Moore,	2 00
Tomatoes.—Three varieties, twelve specimens each, J. Cummings,	4 00
Second, G. W. Pierce,	3 00
Third, C. E. Grant,	2 00
Acme, John Cummings,	2 00
Second, G. W. Pierce,	1 00
Boston Market, John Cummings,	2 00
Second, Walter Russell,	1 00
Emery, John Cummings,	2 00
Second, Samuel G. Stone,	1 00
Gen. Grant, John Cummings,	2 00
Second, C. E. Grant,	1 00
Any other variety, John Cummings, Paragon,	2 00
Second, Aaron Low, Essex Hybrid,	1 00
Martynias.—Twenty-four, M. W. Chadbourne,	2 00
Second, George Craft,	1 00
Okra.—Twenty-four specimens, Mrs. M. T. Goddard,	2 00
Peppers.—Twenty-four, C. N. Brackett,	3 00
Second, G. F. Stone,	2 00
Third, George W. Pierce,	1 00
Gratuities:—	
W. S. Ewell, Tomatoes,	1 00
C. E. Grant, "	1 00
Aaron Low, Hybrid Squashes,	1 00

Josiah Pratt, Canada Squashes,	$1 00
David Warren, Butman Squashes,	1 00
A. T. Brown, Squashes,	1 00
M. W. Chadbourne, Melons,	1 00
C. D. Kingman, Sweet Potatoes,	1 00
Benjamin G. Smith, Beets,	1 00
C. N Brackett, "	1 00
F. Trebandt, Endive,	1 00
Horace Partridge, Pop Corn,	1 00
John Cummings, Collection,	3 00
Samuel Hartwell, "	2 00
M. W. Chadbourne, "	2 00
C. N. Brackett, "	1 00
Dr. G. G. Kennedy, "	1 00
George W. Pierce, "	1 00
C. E. Calder, Lettuce,	1 00

SEPTEMBER 25.

Gratuities: —

Samuel G. Stone, Lima Beans,	1 00
C. E. Grant, " "	1 00

OCTOBER 2.

SALSIFY.—Twelve roots, B. G. Smith,	2 00
Second, M. W. Chadbourne,	1 00
CABBAGES.—Three Drumhead, J. Cummings,	2 00
Second, Samuel Hartwell,	1 00
Red, John Cummings,	2 00
Savoy, " "	2 00
Second, Samuel Hartwell,	1 00
CAULIFLOWERS.—Four, J. Cummings,	3 00
CELERY.—Four heads, Josiah Crosby,	3 00

Gratuities:—

B. G. Smith, Lima Beans,	1 00
J. L. Gardner, Endive,	1 00
S. G. Stone, Collection,	1 00
Samuel Hartwell, "	1 00
C. E. Grant, "	1 00
M. W. Chadbourne, "	1 00

OCTOBER 16.

Gratuity :—

Josiah Crosby, Celery,	1 00

October 30.

Gratuity :—

Josiah Crosby, Celery,	$1 00

November 10.

Gratuities :—

Josiah Crosby, Celery,	1 00
Cephas H. Brackett, Cucumbers,	1 00
Samuel Hartwell, Collection,	1 00
C. E. Grant, "	1 00

REPORT

OF THE

COMMITTEE ON GARDENS,

FOR THE YEAR 1880.

Your Committee beg leave to report that, although the prizes offered have failed to draw competition, they are not discouraged, for they remember that precisely the same state of things occurred in 1864; but, since then, many beautiful places have been examined and reported on by the Committee, who have made such awards as in their judgment were deserved. The Committee believe that this branch of the Society's work, during these years, has had its full share in the advancement of horticulture, especially in Landscape Gardening, where it rises to the dignity of a fine art, and they have faith that its interest will revive, and that its influence will be as useful as ever.

The Society are certainly under great obligations to the gentlemen who, in past years, have opened their elegant grounds and homes, to the examination of the Committee, and extended hospitalities to its members, and others. The proprietors of these estates are benefactors of no ordinary kind, not only to your Committee, and this Society, but to the community, in creating and maintaining establishments so attractive and useful to all lovers of horticulture, as examples of what can be accomplished by wise and judicious expenditure.

These tangible examples of successful landscape gardening and horticulture, are of far greater value to the lover of the beautiful than any dry disquisition on the art we love so well.

Active competition has a great deal to do with the success of any society, especially one of the character of ours; and we trust that in the future, a more lively interest in this direction will be manifested.

For the Committee,

BENJAMIN G. SMITH, *Chairman.*

REPORT

OF THE

COMMITTEE OF ARRANGEMENTS,

FOR THE YEAR 1880.

The Committee of Arrangements, respectfully submit herewith their report for the present year.

The Committee congratulate the members of the Massachusetts Horticultural Society upon the excellent and fine exhibitions during the year 1880. The show of Azaleas and Roses in March, was superior to any ever made, and gave great satisfaction. The Rose and Strawberry Show, in June, notwithstanding the extreme heat and dry weather of the week or ten days previous, was much better than we had reason to expect, and was indeed very fine.

The weekly shows have been equal, if not superior, to those of previous years, and more fully attended.

The Annual Exhibition, on the 14th, 15th, 16th, and 17th of September, has never been surpassed in excellence and beauty; the large display of plants by numerous contributors was truly magnificent, and the great quantities of Cut Flowers, Bouquets, Fruits, and Vegetables, were much admired by the many visitors who had the good fortune to visit the exhibition. Too much praise cannot be awarded the several committees for their labor and care in arranging the choice selections of plants, flowers, fruits, and vegetables of the many contributors.

The deep interest felt by the members in the success and prosperity of the Society increases year by year, and the work commenced more than fifty years ago for the advancement of pomology and of gardening in all its branches, goes on with undiminished and increased ardor and love.

The Committee believe that although so much has been done—so many new fruits, plants, flowers, and vegetables have been intro-

duced and successfully cultivated, yet much more is to be accomplished, requiring the renewed and vigorous efforts of every one connected with the Society, and who believes in its glorious future. The Massachusetts Horticultural Society is still in its infancy, but with an active and untiring interest in its welfare and prosperity, it cannot fail in time to become one of the greatest and most powerful means for the benefit and happiness of mankind.

The Committee have found it desirable to have a permanent record of their action at the meetings held from time to time, and at their request the Secretary of the Society has kept such a record, but as the doings of the Committee at their meetings are merely matters of business, in relation to the collecting and arranging of the fruits, plants, flowers, and vegetables for the exhibitions, they would be of little interest in this report.

For the Committee,

CHARLES H. B. BRECK, *Chairman.*

REPORT

OF THE

COMMITTEE ON PUBLICATION AND DISCUSSION,

FOR THE YEAR 1880.

The chief event which we are called to notice has been the publication of the History of the Society. After a consideration of various plans it was judged best to print only an edition sufficiently large to supply the want of the members and such present demand from the public as we might reasonably anticipate. The price to subscribers has been placed somewhat below the actual cost, if we include the cost of stereotypes, steel plate, and heliotypes, and yet the entire cost will not involve the Society in a large expense after deducting the amount received from sales. The total cost of the edition has been $1,200. But we now own all the plates and stereotypes, so that a future edition may be produced at comparatively little cost. We believe that no other such publication in this country contains so much and such valuable information connected with our art, and we think the Society is greatly indebted to its editor for the clear and connected record which he has given. We are confident the volume will become increasingly valuable.

The extra labor which was placed upon our editor in the preparation of a carefully revised list of members, together with work demanded by the American Pomological Society, delayed the publication of the second part of our Transactions beyond the usual time. We believe the discussions have been maintained with the usual interest, and that the Transactions, under the careful reporting of our Secretary, will be found to contain valuable information. Since the establishment of this course of essays, lectures, and discussions, we think much good has resulted; information has been diffused and our members have been stimulated in their endeavors. It is

an influence which we cannot measure, and therefore we may be inclined to undervalue and underestimate it. But it must be apparent that such a body of intelligent cultivators may communicate their observations and experience to very great profit. We might also avail ourselves of the services of professional specialists and thus obtain information and secure credit to the Society. While we are by no means discouraged in the results which have already been attained in this direction, yet we are convinced that more should be attempted. The retiring members of this Committee take this opportunity again to urge upon the members of the Society to bring all their resources to the aid of the new Committee, and thus to make certain the result of mutual profit to themselves and credit to the Society.

W. C. STRONG,
A. B. MUSSEY,
E. L. STURTEVANT,
} *Committee.*

Report of the Secretary,

FOR THE YEAR 1880.

At the date of my last report, the History of the Society had just been placed in the hands of the printer. When the work had arrived at that stage, it was necessary that my first attention should be given to it, and this was accordingly done, at the expense of postponing all other work that could be. The list of officers and members to be found in the Appendix, was not included in the original plan, and its preparation was not commenced until after the printing of the History had begun. Its preparation required much time and care, and added to the time occupied in printing the book; but, it is believed to increase the value of the History to such an extent that the delay caused by it will not be regretted. The typographical execution of the book, it is believed, has given entire satisfaction to all; and I only regret that my utmost efforts were unsuccessful in inducing the printers to push the work more rapidly. The various agricultural and horticultural journals, to which copies have been sent, have spoken of it with high commendation, and the manner in which it has been received, generally, is such as to lead to the belief that the whole edition, now printed, may be disposed of. At present, a considerable number of subscribers have not called for their copies; but, it is hoped that before the close of the year, all subscribers' copies will be delivered.

Some time before the History was placed in the hands of the printer, I had commenced the preparation for the press of the second part of the Transactions for 1879, but this was among the things on which work was necessarily suspended, when the History was put to press. It was resumed as soon as the History was so far completed as to allow it, and has now been completed, and the arrears of the Transactions, still remaining, will soon be brought up. The various records mentioned in former reports, which it has devolved on me to keep, need not be again enumerated here; but,

I may say, that this year there has been added to them a record of the meetings of the Committee of Arrangements, which the Committee were desirous to have in permanent form. Many specimens of fruit have been presented for name, but not as many as last year. The multifarious calls on the time of a Secretary, which it is impossible to specify, have not been less than usual, and with those which I have attempted to indicate, have thoroughly filled my time.

ROBERT MANNING, *Secretary.*

REPORT

OF THE

LIBRARY COMMITTEE,

FOR THE YEAR 1880.

The Committee on the Library present the following, as their report for the year 1880.

The Society's appropriation, and the income of the Stickney Fund have been expended in the manner for which they were designed; and we believe that the additions to the Library thus obtained have been as valuable as those of any previous year.

The names of newly purchased books have been posted in the Library Room, and all persons have been able to keep themselves informed as to the growth of the library from month to month. It is unnecessary, therefore, to speak in minute detail of the purchases that have been made, but we feel that we ought to congratulate the Society upon the acquisition of Reichenbach's great work upon the plants of Central Europe, in twenty-two volumes, containing colored figures of all the species; also, of the Aroideæ Maximilianæ, a splendid work in folio, whose plates are executed in a manner equal to any which our Library has hitherto possessed.

Meanwhile, we have not neglected to purchase many books of a humbler sort, and of a practical, rather than of a scientific bearing. The cultivation of forest trees and of the sugar beet, and the preservation of crops in a green state by the new process called *ensilage*, are all subjects of very great importance, and an inspection of our book lists for the year, will show that care has been taken to procure for our members all the information available upon these topics.

The removal of the combined bookcase and table, which, in the first part of the year, stood in the centre of this room, has been effected in such a manner that the Society has not been a loser,

the material having been utilized in making the cases which now occupy the upper part of the Fruit Committee's room.

The large additions made this year to the library, prompt us to mention again the subject of a card-catalogue of the colored plates. The sooner this work is entered upon, the smaller will be the cost of it; while, of the need of such a catalogue, there can be no question. If we wish to find a colored figure of any flower, we look in Pritzel's Index; if we find no reference to it there, we are completely baffled, for we have thousands of colored figures which that work does not mention.

The number of books suggested to us for purchase, has been much greater this year than last, and we hope that during the coming year, many more members will make use of the blank book kept for that purpose at the Librarian's desk. It should be borne in mind, in making these requests, that the income of the Stickney Fund can be used only in the purchase of works upon botany, horticulture, and landscape gardening; for this reason, we have been obliged to leave some suggested books unbought.

Two years ago, the Library Committee made an attempt to secure a regular supply of the Catalogues of the leading florists and nurserymen throughout America and Europe; but, by some misunderstanding on their part, only one year's issues were sent. Another trial will soon be made, and, we hope, with better results.

For the Committee,

W. E. ENDICOTT, *Chairman.*

LIBRARY ACCESSIONS.

Books Purchased.

Candolle, Alphonse and Casimir de. Monographiæ Phanerogamarum Prodromi nunc continuatio, nunc revisio. Vol. 2. Araceæ, auctore Engler. Royal 8vo. Paris: 1879.

Bentham, G., and J. D. Hooker. Genera Plantarum. Vol. 3, Part 1. Sistens Dicotyledonum Monochlamydearum Ordines XXXVI, Nyctagineas—Ceratophylleas; et Gymnospermearum Ordines III, Gnetaceas—Cycadaceas. 8vo. London: 1880.

Germain de Saint-Pierre, E. Nouveau Dictionnaire de Botanique. Thick 8vo. 1,600 wood-cuts. Paris: 1870.

Jaume St. Hilaire, J. H. Exposition des Familles Naturelles, et de la Germination des Plantes. 3 vols. 4to. Paris: 1805.

The British Florist. 6 vols. 8vo. 81 colored plates. London: 1846.

Newman, John B., M. D. The Illustrated Botany, comprising the most valuable Native and Exotic Plants, with their History, Medicinal Properties, etc. 8vo. Many colored plates. New York: 1846.

Good, Peter P., A. M. The Family Flora and Materia Medica Botanica. 8vo. 2 vols. in 1. 96 colored plates. Elizabethtown, N. J. 1847.

Bentley, Robert, F. L. S., F. R. C. S., and Henry Trimen, M. B., F. L. S., Medicinal Plants. 4 vols. 8vo. 306 colored plates. London: 1880. [Completed.]

Berge, Fr., and Dr. V. A. Riecke. Gift Pflanzenbuch. New edition. Small 4to. 72 colored plates. Stuttgart, 1855.

Bessey, Charles E., M. Sc., Ph. D. Botany for High Schools and Colleges. Small 8vo. 573 wood-cuts. New York: 1830.

Thomé, Otto W. Text-book of Structural and Physiological Botany. Translated and edited by Alfred W. Bennett, M. A., B. Sc., F. L. S. 2d. ed. Small 8vo. Map and 546 wood-cuts. New York: 1878.

Prantl, Dr. K. An Elementary Text-Book of Botany. Translated from the German; the translation revised by S. H. Vines, M. A., D. Sc., F. L. S. 8vo. 275 wood-cuts. Philadelphia: 1880.

Wakefield, Priscilla. An Introduction to Botany, in a Series of Familiar Letters. 12mo. 12 plates. First American, from the Fifth London Edition. Boston, 1811.

Balfour, J. H., F. R. SS. L. and E., F. L. S. First Book of Botany. 12mo. 197 wood-cuts. New York: 1873.

Youmans, Eliza A. Second Book of Botany, a Practical Guide to the Observation and Study of Plants. Small 8vo. 422 wood-cuts. New York: 1874.

Hibberd, Shirley. Field Flowers, suggesting where to go and what to look for in the out-door study of British Plants. Small 8vo. Colored plates and wood-cuts. London: 1870.

Catlow, Agnes. Popular Field Botany. Third edition. 16mo. 20 colored plates. London: 1852.

Coleman, W. S. Our Woodlands, Heaths, and Hedges. 16mo. Colored plates and wood-cuts. London: 1859.

Watson, Sereno. Botany of the Geological Survey of California. Vol. 2. 4to. Cambridge: 1880.

Bigelow, Jacob, M. D. A Collection of Plants of Boston and its Vicinity. Second edition. 8vo. Boston: 1824.

Rich, Obadiah. A Synopsis of the Genera of American Plants. 16mo. Georgetown: 1814.

Jordan, Alexis, et Julio Fourreau. Icones ad Floram Europæ Novo Fundamento Instauram Spectantes, Tomus 1, Fasciculi 1–40. 200 colored plates. Paris: 1866–68. And Fasciculi 41–56. 80 colored plates.

Martrin-Donos, Victor de. Florule du Tarn. 2 vols. 8vo. Paris: 1864, 1867.

Liégard, Auguste. Flore de Bretagne. 12mo. Paris: 1879.

Reichenbach, Ludovicus; Vols. 13, and onward, L. Reichenbach and H. C. Reichenbach, filio. Icones Floræ Germanicæ, et Helveticæ, etc. 21 vols. 4to. Leipsic: 1850–1867. Also, Nos. 1–16 of vol. 22. In all 2,211 colored plates.

Koch, Dr. Wilh. Dan. Jos., and Ernst Hallier. Taschenbuch der Deutschen und Schweizer Flora, etc. 16mo. Leipsic: 1878.

Garcke, Dr. August. Flora von Nord-und Mittel-Deutschland. 16mo. Berlin: 1854.

Graf, F. Die Alpenpflanzen. Hefte 1–11, 13–21. 16mo. 180 colored plates. Prague: 1879.

Deakin, Richard, M. D. Flora of the Colosseum of Rome. 16mo. Colored plates. London: 1873.

Dillenius, J. J., M. D. Hortus Elthamensis Plantarum Rariorum. 2 vols. folio, in one. 324 plates. Leyden: 1774.

Linnæus, Carolus. Hortus Cliffortianus, etc. Folio. 37 pl. Amsterdam: 1737.

Pomel, A. Nouveaux Matériaux pour la Flore Atlantique. First and second Fasciculi. 8vo. Paris: 1874, 1875. [Extrait du Bulletin de la Société de Climatologie d' Alger.]

Lowe, Richard Thomas, M. A. A Manual Flora of Madeira and the adjacent islands of Porto Santo and the Desertas. Vol. 1, and Part 1 of vol. 2, in one vol. 12mo. London: 1868.

Seubert, Mauritius. Flora Azorica. 4to. 15 plates. Bonn: 1854.

Wight, Robert, M. D., F. L. S., etc. Illustrations of Indian Botany, etc. 2 vols. 4to. 182 colored plates. Madras, 1840, 1850.

Boer, P. de. Coniferis Archipelagi Indici. 4to. pamphlet. 3 plates. Utrecht: 1866.

Franchet, A., and Lud. Savatier. Enumeratio Plantarum in Japonia Sponte Crescentium, etc. Vols. 1 and 2. Royal 8vo. Paris: 1875, 1879.

United States Exploring Expedition, 1838–1842, under the command of Charles Wilkes, U. S. N. Vol. 17, Botany. I. Lower Cryptogamia. II. Phanerogamia of the Pacific Coast of North America. 4to. 29 plates. Philadelphia: 1862–1874.

Frezier, M. Relation des Voyage de la Mer du Sud aux Côtes du Chily et du Perou. Small 4to. 37 plates. Paris: 1732.

Johnson, C. Pierpont. The Useful Plants of Great Britain. 8vo. 24 colored plates, by J. E. Sowerby. London: 1862.

Dickson, James H. The Fibre Plants of India, Africa, and the British Colonies. 8vo. London: 1864.

Peyritsch, Dr. J. Aroideæ Maximilianæ. Folio. Frontispiece and 42 colored plates. Vienna: 1879.

Schott, H. Genera Aroidearum Exposita. Folio. 98 plates. Vienna: 1858.

Miquel, F. A. W. Genera Cactearum. 8vo. pamphlet. Rotterdam: 1839.

Pfeiffer, Dr. Louis, and Fr. Otto. Abbildung und Beschreibung Bluhender Cacteen. Vol. 1. 4to. 30 plates. Cassell: 1843.

Puydt, E. de. Les Orchidées. Royal 8vo. 50 colored plates, and 244 wood-cuts. Paris: 1880.

Fitzgerald, R. D., F. L. S. Australian Orchids. Parts 1 and 2. Folio. 17 colored plates. Sydney: no date.

Rohrbach, Paulus. Tropæolaceæ, Molluginaceæ, Alsinaceæ, Silenaceæ, Portulacaceæ, Ficoidaceæ, Elatinaceæ. Folio, pp. 222–323; plates 53–72. [Martius' Flora Braziliensis]. Leipsic: 1872.

Todaro, Agostino. Relazione sulla Cultura dei Cotoni in Italia, seguita da una Monografia del Genere Gossypium. Small 4to., with folio atlas of 12 colored plates. Rome and Palermo: 1877, '78.

Lehmann, Dr. J. G. C. Monographia Generis Primularum. 4to. 9 plates. Leipsic: 1817.

———————. Revisio Potentillarum. 4to. 64 plates. Breslau and Bonn: 1856.

Franchet, A. Études sur les Verbascum de la France et de l'Europe Centrale. 8vo. pamphlet. Vendome: 1875.

Bocquillon, H. Revue du Groupe des Verbénacées. 8vo. 20 plates. Paris: 1861–1863.

Babington, Charles Cardale, M. A., F. R. S. The British Rubi. 12mo. London: 1880.

Miers, John, F. R. S., F. L. S. The Apocynaceæ of South America. 4to. 35 plates. London and Edinburgh: 1878.

Bureau, Édouard. Monographie des Bignoniacées. Imp. 8vo. 31 plates. Paris: 1864

Hall, Hermannus Christianus Van. Specimen Botanicum Exhibens Synopsin Graminum Indigenarum Belgii Partis Septentrionalis, olim VII provinciarum. 8vo. plate. Utrecht: 1821.

Henderson, John. Handbook of the Grasses of Great Britain and America, 12mo. Northport, L. I: 1875.

Ruprecht, F. J. Bambuseæ. 4to. pamphlet. 18 plates. St. Petersburg: 1839.

Mettenius, Dr. Georg. Filices Horti Botanici Lipsiensis. Folio. 30 plates. Leipsic: 1856.

Bolton, James. Filices Britannicæ, an History of the British Proper Ferns. Part 1. 4to. 31 colored plates. Leeds: 1785.

Newman, Edward. A History of British Ferns. With Plates and Glossary. 16mo. London: no date.

Williamson, John. Fern Etchings; illustrating all the species of ferns indigenous to the Northeastern United States and Canada. Second edition, small 4to. 65 plates. Louisville, Ky.: 1879.

Cooke, M. C., M. A., LL. D., A. L. S. Rust, Smut, Mildew, and Mould; an Introduction to the Study of Microscopic Fungi. 16mo. 7 colored plates. London: 1878.

Brown, Robert, D. C. L., F. R. S. Miscellaneous Botanical Works. Issued by the Ray Society. 2 vols. 8vo. text, and 1 vol. folio, of 37 plates. London: 1866–7.

Henfrey, Arthur, F. L. S, Editor. Reports and Papers on Botany, issued by the Ray Society. I. Mohl on the Structure of the Palm-Stem. II. Nägeli on Vegetable Cells. III. Nägeli on the Utricular Structures in the Contents of Cells. IV. Link's Reports on Physiological Botany, for 1844–45. V. Grisebach's Report on Geographical

Botany for 1844. VI. Grisebach's Report on Geographical and Systematic Botany for 1845. 1 vol. 8vo. London: 1849.

Houston, Gulielmus, M. D., R. S. S. Reliquiæ Houstonianæ. Small 4to. 26 plates. London: 1781.

André, Édouard. Traité Général de la Composition des Parcs et Jardins. Roy. 8vo. 11 chromolithographs, and 520 wood-cuts. Paris: 1879.

The Famous Parks and Gardens of the World Described and Illustrated. 4to. Many wood-cuts. 1880.

Cleveland, H. W. S. Landscape Architecture, as applied to the wants of the West; with an essay on Forest Planting on the Great Plains. 16mo. Chicago: 1873.

Sickler, D. Fr. Karl Ludwig. Allgemeine Geschichte der Obstkultur, etc. 8vo. Map and plates. Frankfort on Main: 1802.

Sickler, J. V. Der Teutsche Obstgartner, etc. 22 vols. small 8vo. Many colored and other plates. Weimar: 1794–1804.

Du Mortier, B.-C. Pomone Tournaisienne. 8vo. 91 outlines of pears. Paris, Leipsic, and Tournay: 1869.

Thomas, O. Guide Pratique de l'Amateur de Fruits. Description et Culture de plus de 5,000 Variétés de Fruits, etc. 8vo. Plantières les Metz.

Elliott, F. R. Hand-book for Fruit Growers. 16mo. Wood-cuts. New York: 1876.

Loubat, Alphonse. The American Vine Dresser's Guide. New edition. Small 8vo. New York: 1872.

Husmann, George. American Grape Growing and Wine Making. New edition. Small 8vo. 31 wood-cuts. New York: 1880.

White, Joseph J. Cranberry Culture. 12mo. 34 wood-cuts. New York: 1870.

Halliday, Robert J. A Treatise on the Propagation and Culture of the Camellia Japonica. 12mo. Colored plates and wood-cuts. Baltimore: 1880.

Prior, W. D. Roses and their Culture. 16mo. Colored plates and wood-cuts. London. No date.

Johnson, Edwin A., D. D. Winter Greeneries at Home. 12mo. 19 wood-cuts. New York: 1878.

Heinrich, J. J. The Window Flower Garden. Small 8vo. Many wood-cuts. New York: 1880.

Courtois-Gérard. De la Culture des Fleurs dans les Petits Jardins, sur les Fenêtres, et dans les Appartements. Sixth edition. 16mo. 15 wood-cuts. Paris. No date.

———. De la Culture Maraichère dans les Petits Jardins. Sixth edition. 16mo. 15 wood-cuts. Paris: no date.

Warner, Anna. Miss Tiller's Vegetable Garden and the Money she made by it. 12mo. New York: 1873.

Robinson, William. Gardening Illustrated, for Town and Country. Vol. 1. For the year ending March 1, 1880. Royal 8vo. Many wood-cuts. London: 1880.

Shinn, Charles H. Pacific Rural Hand-book. Small 8vo. San Francisco: 1879.

Beeton's Book of Garden Management. Small 8vo. Colored and other plates, and wood-cuts. London: 1871.

Wood, Samuel. The Tree Planter and Plant Propagator. 42 wood-cuts. 12mo. London: 1880.

——— ——. The Tree Pruner, being a Practical Manual of the Pruning of Fruit Trees, Shrubs, Climbers, and Flowering Plants. 12mo. 65 wood-cuts. London: 1880.

Elliott, F. R. Popular Deciduous and Evergreen Trees and Shrubs, for planting in Parks, Gardens, Cemeteries, etc. 12mo. 64 wood-cuts. New York: 1870.

Ablett, William H. English Trees and Tree Planting. 8vo. London: 1880.

Mongredien, Augustus. Trees and Shrubs for English Plantations. 8vo. Frontispiece and wood-cuts. London: 1870.

Barnard, George. Studies of Trees from Nature. Folio. 30 plates. London: 1868.

Steuart, Sir Henry, Bart., LL.D., F. R. S. E., etc. The Planter's Guide, or a Practical Essay on the best method of giving effect to wood by the removal of large trees and underwood. 8vo. Plates and wood-cuts. New York: 1832.

Useful and Ornamental Tree Planting. Published under the superintendence of the Society for the Diffusion of Useful Knowledge. 8vo. Wood-cuts. London: 1832.

Clement, M. Manuel Forestier. 12mo. Brussels: 1851.

Fiscali, Ferdinand, and Leopold Grabner. Deutschlands Forstcultur-Pflanzen. 8vo., with folio atlas of 18 plates. Vienna: 1854.

Koltz, J. P. J. Traitement du Chêne en Taillis a Écorces. 12mo. 30 wood-cuts. Brussels: 1859.

Jacquot, Charles. Les Codes de la Législation Forestière, etc. Fourth edition. 16mo. pamphlet. Paris: 1866.

Flagg, Wilson. The Birds and Seasons of New England. 8vo. With illustrations. Boston: 1875.

Scheele de Vere, M. Leaves from the Book of Nature. 12mo. Wood-cuts. New York: 1872.

Bailey, John M. The Book of Ensilage; or, the New Dispensation for Farmers. Also Percheron Horses, Cotswold Sheep, Short Horn Cattle, and Berkshire Swine. 8vo. Photographs and wood-cuts. Billerica, Mass.: 1880.

Brown, J. B. Ensilage of Green Crops. From the French of Auguste Goffart. 8vo. Wood-cuts. New York: 1880.

Tull, Jethro. The Horse-Hoeing Husbandry, with an introduction by William Cobbett. 8vo. London: 1822.

Broom Corn and Brooms. Written and compiled by the editors of the American Agriculturist. 12mo. 22 wood-cuts. New York: no date.

Packard, A. S., Jr., M. D. The Injurious Insects of the West; a Report on the Rocky Mountain Locust and other Insects. 8vo. Wood-cuts, maps, and plates. Salem: 1877.

Dean, G. A. The Culture, Improvement, and Management of Landed Estates. Royal 8vo. 12 eolored plates. London: 1880.

Marsh, George P. The Earth as Modified by Human Action; a new edition of Man and Nature. 8vo. New York: 1877.

Lippineott's Gazetteer of the World. New edition. Royal 8vo. Philadelphia: 1880.

Books and Pamphlets Presented.

Roe, Edward P. Sueeess with Small Fruits. Small 4to. Many wood-cuts. New York: 1880. The Author.

Drope, Franeis. A Short and Sure Guide in the Practice of Raising and Ordering of Fruit Trees. 16mo. Oxford: 1672. John Robinson.

Wallaee, Dr. Notes on Lilies and their Culture. Second edition. 8vo. Wood-euts. Colehester, England: 1879. The Author.

Peaeock, J. T. List of Sueeulent Plants in his Collection at Sudbury House, the Octagon House at Kew, the Alexandra Palaee Conservatories, and the Royal Botanieal Garden, Regent's Park. 12mo. pamphlet. London: 1878. Waldo O. Ross.

Riley, Charles V. State Entomologist. First to Eighth Annual Reports on the Noxious, Benefieial, and other Inseets of the State of Missouri. 2 vols. 8vo. Jefferson City: 1869–76. Isidor Bush.

Eaton, Daniel C. Systematie Fern List of the United States. 8vo. pamphlet. New Haven: 1880. The Author.

Martindale, Isaae C. Notes on the Bartram Oak, Quereus Heterophylla, Michx. 8vo. pamphlet. Camden, N. J.: 1880. The Author.

Sargent, Charles S., Speeial Agent Tenth Census. A Catalogue of the Forest Trees of North America. 8vo. pamphlet. Washington: 1880.

Catalogue of Trees and Shrubs, Native of, and Introdueed in the Hortieultural Gardens, adjaeent to Horticultural Hall, in Fairmount Park, Philadelphia. 8vo. pamphlet. Philadelphia: 1880.

Hodges, Leonard B. The Forest Tree Planter's Manual. 2d edition, revised and eorreeted. 8vo. pamphlet. St. Paul, Minn.: 1880. The Author.

Annuaire des Eaux et Forêts pour 1880. 19e annće. 24mo. Paris: 1880.

Parsons, Samuel B. Woman in Horticulture, an Essay read before the New York Horticultural Soeiety, May 4, 1880. Small 12mo. pamphlet. The Author.

Henderson, Peter. Essay on Hortieultural Progress, read before the New York Horticultural Soeiety, Mareh 9, 1880. With a List of Members of the Soeiety. 16mo. pamphlet. New York: 1880.

Western New York Hortieultural Soeiety. Proeeedings at the Twenty-fifth Annual Meeting, Rochester, January 28 and 29, 1880. 8vo. pamphlet. Rochester: 1880. P. C. Reynolds.

New Jersey Horticultural Soeiety. Proeeedings at the Fourth Annual Meeting, January 15 and 16, 1879. 8vo. pamphlet. Newark: 1880. E. Williams, Seeretary.

Pennsylvania Horticultural Society. Catalogue of the Library. 8vo. pamphlet. Philadelphia: 1850. J. E. Mitchell.

Georgia Horticultural Society. Proceedings at the Fifth Annual Meeting, at Atlanta, August 3 and 4, 1880. 8vo. pamphlet. Atlanta: 1880. T. L. Kinsey, Secretary.

Ohio Horticultural Society. Thirteenth Annual Report, for 1879–80. 8vo. pamphlet. Columbus: 1880. George W. Campbell, Treasurer.

Illinois Horticultural Society. Transactions for the years 1878 and 1879. New series, Vols. 12 and 13. 2 vols. 8vo. Chicago: 1879, '80. O. B. Galusha, Secretary.

Indiana Horticultural Society. Transactions for 1873. 8 vo. Lafayette: 1873. W. D. Schooley. Transactions for 1876 and 1878. 2 vols. 8vo. Indianapolis: 1877, 1879. D. E. Hoffman.

Iowa Horticultural Society. Transactions for 1869, G. C. Brackett; 1876, R. Manning, 1872, 1877, and 1878; C. L. Watrous, President. 1 pamphlet and 4 vols. Des Moines: 1870, '73, '77, '78, '79.

Missouri State Board of Agriculture, and Missouri Horticultural Society. Reports for 1879. 8vo. pamphlet. Jefferson City: 1880. Norman J. Colman, President of the Horticultural Society.

Kansas Horticultural Society. Report for 1879, with the Proceedings of Division, County, and Local Societies. 8vo. Portraits and wood-cuts. Topeka: 1880. G. C. Brackett, Secretary.

Montreal Horticultural Society and Fruit Growers' Association of the Province of Quebec. Third Report, 1877. L. A. H. Latour. Fifth Report, 1879. Henry S. Evans, Secretary. 2 pamphlets. 8vo. Montreal: 1878, 1880.

Maine Pomological Society. Fifth and Sixth Reports of the Secretary for 1877 and 1878. 2 pamphlets. 8vo. Augusta: 1878, '79. George B. Sawyer, Secretary.

Pennsylvania Fruit Growers' Society. Reports for 1867, '70, '71, '72, '76, '77, '78, '79. 1 vol. and six pamphlets, 8vo. Plates. E. B. Engle, Secretary. Harrisburg: 1870, '71, '73, '76, '78, '79.

Michigan Pomological Society. Ninth Annual Report, for 1879. 8vo. Lansing: 1880. Charles W. Garfield, Secretary.

Ontario Fruit Growers' Association. Report for 1879, with the Report of the Ontario Entomological Society for 1879. Large 8vo. pamphlet. Wood-cuts of insects. Toronto: 1880.

Worcester Commission of Public Grounds. Report for 1879. 8vo. pamphlet. Edward W. Lincoln, Secretary.

Baltimore Park Commission. Twelfth and Twentieth Annual Reports for 1871 and 1879. 2 pamphlets. 8vo. With Plans of Parks. Baltimore: 1872, 1880. The Commission.

United States Department of Agriculture. Report of the Commissioner for 1878. 8vo. Plates. Washington: 1879. William G. Le Duc, Commissioner.

Maine Board of Agriculture. Twenty-third Annual Report of the Secretary, for 1878. 8vo. Augusta: 1879. Z. A. Gilbert, Secretary.

Massachusetts Board of Agriculture. Twenty-seventh Report, for 1879. 8vo. Boston: 1880. Charles L. Flint, Secretary.

Connecticut Board of Agriculture. Thirteenth Annual Report, for 1879–80. 8vo. Hartford: 1880. T. S. Gold, Secretary.

New Jersey Board of Agriculture. Seventh Annual Report, for 1879. 8vo. pamphlet. Two copies. P. T. Quinn, Secretary.

Pennsylvania Board of Agriculture. Tenth Quarterly Report, for September, October, and November, 1880. 8vo. pamphlet. Harrisburg: 1880. Thomas J. Edge, Secretary.

Indiana State Board of Agriculture. Twenty-ninth Annual Report. 8vo. Indianapolis: 1879. Alexander Heron, Secretary.

Kansas State Board of Agriculture. Quarterly Report, September, 1879. 8vo. pamphlet. Alfred Gray, Secretary.

Essex Agricultural Society. Transactions for 1879. 8vo. pamphlet. Salem: 1879. Charles P. Preston, Secretary.

Low, David W. The Pioneer Industries of Essex County: Planting and Fishing, an Annual Address before the Essex Agricultural Society at their Fifty-eighth Annual Exhibition, Lynn, September 28 and 29, 1880. 8vo. pamphlet. Salem: 1880. The Author.

Maine College of Agriculture and the Mechanic Arts. Annual Reports of the Trustees, President, Farm Superintendent, and Treasurer, Orono, 1879. 8vo. pamphlet. Augusta: 1879.

Beal, Professor W. J. Report of the Professor of Botany and Horticulture in Michigan Agricultural College for 1880. 8vo. pamphlet. 1880. The Author.

——— —— — —. Experiments and other work of the Horticultural Department of Michigan Agricultural College. 8vo. pamphlet. The Author.

Iowa Agricultural College. Eighth Biennial Report, 1878 and 1879. 8vo. pamphlet. Des Moines, 1880. Professor C. E. Bessey.

Sturtevant, E. Lewis, M. D. Some Thoughts and Facts concerning the Food of Man. 8vo. pamphlet. 1880. The Author.

——— — —— —. Indian Corn. 8vo. pamphlet. Albany: 1880. The Author.

Killebrew, J. B. Sheep Husbandry. 8vo. pamphlet. Nashville: 1880. The Author.

Boston Society of Natural History. Proceedings. Vol. 20, Part 2. November, 1878, to April, 1879. 8vo. pamphlet. Boston: 1879. Memoirs. Vol. 3, Part 1, No. 3. 4to. pamphlet. Boston: 1879. The Society.

Hyatt, Alpheus, Custodian. General Guide to the Museum of the Boston Society of Natural History. I. Introduction. 12mo. pamphlet, with plans of the Museum. Boston: 1880. The Society.

A Brief Account of some of the Scientific Institutions of Boston and Vicinity. Prepared by the Local Committee of the American Association for the Advancement of Science, for distribution to the members of the Association, at the Boston Meeting, August, 1880. 8vo. pamphlet. 1880. Samuel H. Scudder.

St. Louis Academy of Science. Transactions. Vol. 4, No. 1. 8vo. pamphlet. 3 plates. St. Louis: 1880.

Indiana Department of Statistics and Geology. First Annual Report, 1879. 8vo. Indianapolis: 1880. D. E. Hoffmann.

Massachusetts Institute of Technology. Fifteenth Annual Catalogue. 8vo. pamphlet. Boston: 1880. R. H. Richards, Secretary.

United States Commissioner of Education. Reports for 1876, '77, '78. Three vols. 8vo. Washington: 1878, '79, '80. Hon. John Eaton, Commissioner.

Massachusetts State Library. Catalogue. Royal 8vo. Boston: 1880. John W. Dickinson, Librarian.

Astor Library, New York. Thirty-first Annual Report of the Trustees, 1879. 8vo. pamphlet. Albany: 1880. R. Little, Superintendent.

Peabody Institute, Peabody, Mass. Twenty-eighth Annual Report of the Trustees. 8vo. pamphlet. Peabody: 1880.

Hudson, Charles. History of the Town of Lexington, Massachusetts, with a Genealogical Register of Lexington Families. 8vo., portraits and wood-cuts. Boston: 1868. Charles O. Whitmore.

American Antiquarian Society. Proceedings, No. 74, October, 1879. 8vo. pamphlet. Worcester: 1880. The Society.

New England Historic Genealogical Society. Address of Hon. Marshall P. Wilder, President, and other Proceedings at the Annual Meeting, January 7, 1880. 8vo. pamphlet. Boston: 1880. Hon. Marshall P. Wilder.

The Boston Transcript's Fiftieth Birthday. Small 4to., wood-cuts. Boston: 1880. [Privately printed.] The Transcript Company.

Periodicals Taken.

English. — Gardeners' Chronicle.
Gardener's Magazine.
Journal of Horticulture and Cottage Gardener.
The Garden.
Gardening Illustrated.
Curtis's Botanical Magazine.
Floral Magazine.
Florist and Pomologist.
Floral World.
Journal of the Linnean Society.
Journal of Botany.
Country Gentleman's Magazine.
Farmer's Magazine.
Journal of the Royal Agricultural Society.
Journal of Forestry.

French. — Revue Horticole.
Revue des Eaux et Forêts.

Belgian. — Illustration Horticole.
Flore des Serres.

Belgique Horticole.
Revue de l' Horticulture, Belge et Étrangère.
GERMAN. — Botanische Zeitung.
Gartenflora.
AMERICAN. — Country Gentleman.

PERIODICALS PRESENTED.

New England Farmer.
Massachusetts Ploughman.
American Cultivator.
American Agriculturist.
Gardener's Monthly,
American Entomologist.
Vick's Illustrated Monthly Magazine.
Canadian Horticulturist.
Botanical Index.
Bulletin de la Société Centrale d' Horticulture du Department de la Seine Inférieure.
Bulletino della R. Società Toscana di Orticultura.
Semi-Tropic Californian.
California Horticulturist.
Southern California Horticulturist.
American Rural Home.
Maine Farmer.
Prairie Farmer.
Maryland Farmer.
Bulletin of the Torrey Botanical Club.
Botanical Gazette.
Rhode Island Press.
Boston Evening Transcript.
Boston Daily Globe.
Daily Evening Traveller.
Boston Morning Journal.
Boston Daily Advertiser.
The Nursery.
The Cottage Hearth.

TREASURER'S REPORT,

FOR THE YEAR 1880.

ITEMS OF INCOME.

Balance of Cash on hand,	$201 88	
Received for Rent of Stores,	9,144 40	
" " " Halls,	11,033 32	
" " Admissions and Assessments,	878 00	
" from Mount Auburn,	3,255 56	
" " three Exhibitions,	523 50	
" " Sale of History,	500 00	
" " Sundries,	19 20	
Interest on Bonds C. B. & Q. R. R.,	105 00	
		$25,660 86

ITEMS OF EXPENDITURE.

Salaries,	$2,675 00	
Labor,	609 90	
Incidentals,	99 86	
Heating and Water (less paid by tenants),	491 59	
Gas,	1,248 85	
Furniture, Repairs, and Fixtures,	573 94	
Repairs on Building,	381 62	
Taxes,	3,457 71	
Library accessions (Stickney fund),	702 56	
" " (Periodicals and Binding),	184 01	
Expenses of three Exhibitions,	456 37	
Prizes for 1879,	1,153 50	
" " 1880, (deposited for),	3,000 00	
Committee of Arrangements,	234 00	
" " Publication and Discussion,	65 00	
Amounts carried forward,	$15,333 91	$25,660 86

Amounts brought forward,	$15,333 91	$25,660 86
Publication of History,	1,200 00	
Printing,	524 66	
Stationery and Postage,	177 86	
Interest,	3,960 00	
Legal Services,	30 00	
Insurance,	759 37	
Balance carried to new account,	3,675 06	
		$25,660 86

Boston, January 13, 1881.

E. W. Buswell, *Treasurer:*

We have examined the above account and found it correct, and the balance of cash on hand, three thousand six hundred and seventy-five 6-100 dollars, as stated.

C. O. Whitmore,
H. H. Hunnewell,
B. P. Cheney,
} *Finance Committee.*

ASSETS AND LIABILITIES.

Assets.

Real Estate, Furniture, and Exhibition Ware, costing		$256,585 56
Library last year,	$18,959 67	
Added this year,	886 57	
		19,846 24
Bonds of C. B. & Q. R. R. par value,		1,500 00
		$277,931 80
Stereotype and steel plates and copies of History at cost,		700 00
Cash on hand,		3,675 06
		$282,306 86

Liabilities.

Mortgage debt at 5½ per cent., payable September, 1883,	$60,000 00	
Loan without interest, payable to Harvard College in 1899,	12,000 00	
Note to Massachusetts National Bank,	12,000 00	
		$84,000 00
Balance of assets over liabilities,		$198,306 86

By last report our members numbered:

Life,		563	
Added,		15	
		578	
Deceased,		6	
			572
Annual,	294		
Added,	6		
	300		
Deceased,	6		
Withdrawn,	1		
Discontinued,	22		
	29		
		271	
			843

Income from the above:

15 Life Members,	$450 00
6 Annual,	60 00
184 Assessments,	368 00
	$878 00

By my last report was shown an unpaid balance of the prizes for the preceding year. That has been paid, and a sum deposited sufficient to meet those of the year now closed. The amount charged to the publication of the History, includes the payment of a note given to the Publication Committee, to cover an appropriation made last year.

The hope I expressed in my last report, of an increase in the rentals of the halls has been fully met; and the same may be said of the stores.

Our proportion from Mount Auburn is larger than last year, while our expenditures have not been materially increased. This leaves us a larger surplus than for several preceding years, which might properly be applied to the reduction of our debt, but for the necessity which exists for repairs on the building. These have become imperative, and to be properly made, will require a larger expenditure than we can now command; this, too, without any alterations in the interior, so strongly recommended by the President. The halls have, by much use, become unsuitable for the

better class of occupants, and require renovation. The library room also needs painting and the furniture needs repairs.

The stores are now rented so as to promise no increase of rent, and we shall be fortunate if in the coming year, we realize from the halls anything like the revenue now reported. The amount charged to the previous account is that actually paid; the amount awarded being very generally drawn. Mr. Hunnewell, as has been his custom, has appropriated his awards to special prizes, and a very few, of trifling amount, remain undrawn.

During the year we have paid all our current expenses, including the prizes awarded, say, . . .	$3,000 00
And have paid a balance of 1879 prizes, . .	1,153 00
And on the History over receipts, ...	700 00
And an increase of taxes, ...	573 00
Insurance for five years, ...	759 00
And have a balance in cash exceeding that at the commencement of the year, of	3,474 00
This amount, ...	9,659 00
Less an increased sum from Mt. Auburn, of . .	1,043 00
Shows a net increase in receipts of . . . over that of last year.	$8,616 00

E. W. BUSWELL, *Treasurer.*

Dr. *Massachusetts Horticultural Society, in account with the Proprietors of the Cemetery of Mt. Auburn.* **Cr.**

For Sales and Improvements within the Cemetery for the year ending December 31st, 1880.

Cost of filling up and improving land at Mt. Auburn, for the year ending December 31, 1880; the Massachusetts Horticultural Society being charged with their proportion of the same:		
Grading Swan and Magnolia Avenues, . . .	$482 25	
" Pearl and Crystal Avenues, . . .	2,205 50	
One-quarter of	$2,687 75	$671 94
Balance due Massachusetts Horticultural Society,		3,255 56
		$3,927 50

By Sales in January, ...		$515 00
" " " February, ...		1,115 00
" " " March, ...		1,552 00
" " " April, ...		1,337 50
" " " May, ...		1,442 75
" " " June, ...		3,619 00
" " " July, ...		1,728 00
" " " August, ...		635 00
" " " September, ...		305 00
" " " October, ...		2,059 75
" " " November, ...		2,100 00
" " " December, ...		338 00
Net amount of receipts from Receiving Tomb,		418 00
		$17,165 00
Less paid for graves in public lots, repurchased,		55 00
		$17,110 00
Deduct for annual expenses, ...		1,400 00
Mass. Horticultural Society, one-fourth part of .	$15,710 00	
		$3,927,50

E. & O. E.

H. B. MACKINTOSH, *Treasurer.*

December 31, 1880.

MASSACHUSETTS HORTICULTURAL SOCIETY,

To THE PROPRIETORS OF THE CEMETERY OF MOUNT AUBURN, *Dr.*

For one-fourth part of the following expenditures for grading new lands for sale, during 1880:

Swan and Magnolia Avenues.

60 days, men, ...	$120 00	
103½ days, man and horse, ...	362 25	
		$482 25

Pearl and Crystal Avenues.

527 days, men, ...	1,054 00	
329 days, man and horse, ...	1,151 50	
		2,205 50
		$2,687 75
One-fourth part, ...		671 94

MOUNT AUBURN, December 31, 1880. J. W. LOVERING, *Supt.*

I certify the foregoing to be a true copy of accounts of improvements for the year 1880, rendered by the Superintendent.

H. B. MACKINTOSH, *Treasurer.*

Massachusetts Horticultural Society.

OFFICERS AND STANDING COMMITTEES FOR 1881.

President.

FRANCIS B. HAYES, of Boston.

Vice-Presidents.

JOHN B. MOORE, of Concord.
JOHN CUMMINGS, of Woburn.
J. WARREN MERRILL, of Cambridge.
BENJAMIN G. SMITH, of Cambridge.

Treasurer and Superintendent of the Building.*

GEORGE W. FOWLE, of Boston.

Secretary and Librarian.

ROBERT MANNING, of Salem.†

Recording Secretary.

ROBERT MANNING, of Salem.

Professor of Botany and Vegetable Physiology.

JOHN ROBINSON, of Salem.

Professor of Entomology.

SAMUEL H. SCUDDER, of Cambridge.

Standing Committees.

Executive.

THE PRESIDENT, FRANCIS B. HAYES, Chairman.
THE EX-PRESIDENTS, MARSHALL P. WILDER, CHARLES M. HOVEY, JAMES F. C. HYDE, WILLIAM C. STRONG, FRANCIS PARKMAN, WILLIAM GRAY, JR.; CHAIRMAN OF FINANCE COMMITTEE, C. O. WHITMORE; F. L. AMES, CHARLES H. B. BRECK, JOHN C. HOVEY, HENRY P. WALCOTT.

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* Ed. W. Buswell held the office of Treasurer until June, when he resigned and was succeeded by Mr. Fowle.

† Communications for the Secretary, on the business of the Society, should be addressed to him at Horticultural Hall, Boston.

Finance.

CHARLES O. WHITMORE, Chairman.
H. HOLLIS HUNNEWELL. FRANCIS B. HAYES.

Publication and Discussion.

BENJAMIN G. SMITH, Chairman.
E. LEWIS STURTEVANT. JOHN B. MOORE.

Establishing Prizes.

CHAIRMAN OF COMMITTEE ON FRUITS, Chairman;
CHAIRMEN OF COMMITTEES ON FLOWERS, VEGETABLES, AND GARDENS, *EX OFFICIIS;* C. M. ATKINSON, P. BROWN HOVEY, FEARING BURR.

Library.

WILLIAM E. ENDICOTT, Chairman.
THE PROFESSOR OF BOTANY AND HORTICULTURAL PHYSIOLOGY AND THE PROFESSOR OF ENTOMOLOGY, *EX OFFICIIS;*
HENRY P. WALCOTT. FRANCIS H. APPLETON.
J. D. W. FRENCH. ROBERT MANNING.

Gardens.

JOHN G. BARKER, Chairman.
CHAIRMEN OF COMMITTEES ON FRUITS, FLOWERS, AND VEGETABLES, *EX OFFICIIS;* GEORGE S. HARWOOD, HENRY ROSS, JOHN C. HOVEY.

Fruit.

E. W. WOOD, Chairman.

P. BROWN HOVEY.	CHARLES F. CURTIS.	O. B. HADWEN.
BENJAMIN G. SMITH.	J. W. MANNING.	WARREN FENNO.

Plants and Flowers.

WILLIAM H. SPOONER, Chairman.

E. H. HITCHINGS.	F. L. HARRIS.	CHARLES W. ROSS.
PATRICK NORTON.	JAMES CARTWRIGHT.	J. H. WOODFORD.

Vegetables.

CHARLES N. BRACKETT, Chairman.

JOSIAH CROSBY.	GEORGE W. PIERCE.	CHARLES E. GRANT.
WALTER RUSSELL.	SAMUEL HARTWELL.	M. W. CHADBOURNE.

Committee of Arrangements.

CHARLES H. B. BRECK, Chairman.
CHAIRMEN OF COMMITTEES ON FRUITS, FLOWERS, VEGETABLES, AND GARDENS, *EX OFFICIIS;*

JOHN C. HOVEY.	C. M. ATKINSON.	JAMES COMLEY.
HERVEY DAVIS.	CHARLES H. HOVEY.	WILLIAM H. HALLIDAY.
CHARLES F. CURTIS.		JOSEPH H. WOODFORD.

MEMBERS FOR LIFE.

Change of residence, or any inaccuracies, should be promptly reported to the Secretary.

Adams, George E.,	Medford.	Beal, Alexander,	Dorchester.
Albro, Charles,	Taunton.	Beckford, D. R., Jr.,	Dedham.
Alger, R. F.,	Hinsdale.	Bell, Joseph H.,	Quincy.
Ames, F. L.,	North Easton.	Bemis, Emery,	Grantville.
Ames, Frank M.,	Canton.	Berry, James,	Boston.
Ames, George,	Boston.	Bickford, Weare D.,	Allston.
Ames, P. Adams,	"	Birchard, Charles,	Arlington.
Amory, Charles,	"	Black, James W.,	Boston.
Amory Frederick,	Brookline.	Blagg, Samuel,	Newbern, N. C.
Amory, James S.,	Boston,	Blanchard, J. W.,	Boston.
Anderson, Alexander,	Hingham.	Blaney, Henry,	Brookline.
Andrews, Charles L.,	Swampscott.	Blinn, R. D.,	Lexington.
Andrews, Frank W.,	Boston.	Bocher, Ferdinand,	Boston.
Andros, Milton,	Brookline.	Bockus, Charles E.,	Dorchester.
Appleton, Edward,	Reading.	Bond, George W.,	Boston.
Appleton, Francis H.,	Peabody.	Borland, John N ,	New London, Ct.
Appleton, Wm. S.,	Boston.	Botume, John,	Stoneham.
Atkins, Elisha,	Belmont.	Bouvé, Thomas T.,	Boston.
Avery, Edward,	Boston.	Bowditch, Azell C.,	Somerville.
Ayer, Adams,	"	Bowditch, J. Ingersoll,	Boston.
Ayling, Isaac,	"	Bowditch, Wm. E.,	"
		Bowker, William H.,	"
Bacon, George,	Brookline.	Brackett, Cephas H.,	Brighton.
Bailey, Edwin C.,	Concord, N. H.	Brackett, Charles N.,	Newton.
Baker, William E.,	Boston.	Bradish, Levi J.,	Boston.
Bancroft, John C.,	Milton,	Bragg, Samuel, A. B.,	Mattapan.
Banfield, Francis L.,	Boston.	Breed, Andrews,	Lancaster.
Barnard, Rev. C. F.,	"	Breed, Henry A.,	Lynn.
Barnard, James M.,	"	Bresee, Albert,	Hortonville, Vt.
Barnard, Robert M.,	Everett.	Brewer, John Reed,	Boston.
Barnes, Walter S.,	Somerville.	Brewer, Otis,	"
Barnes, William H.,	Boston.	Brigham, William T.,	"
Barney, Levi C.,	"	Bright, William E.,	Waltham.
Barratt, James,	Cambridge.	Brimmer, Martin,	Boston.
Barrows, Thomas,	Dedham.	Brintnall, Benjamin,	"
Bartlett, Edmund,	Newburyport.	Brooks, Francis,	Medford.
Bates, Amos,	Hingham.	Brooks, J. W.,	Milton.
Bates, Caleb,	Kingston.	Brown, Charles E.,	Yarmouth, N.S.
Bayley, John P.,	Boston.	Brown, Edward J.,	Brookline.

Brown, G. Barnard,	Boston.	Cleary, Lawrence,	West Roxbury.
Brown, George B.,	"	Clement, Asa,	Dracut.
Brown, Jacob,	Woburn.	Cleveland, Ira,	Dedham.
Brownell, E. S.,	Essex Junc., Vt.	Cobb, Albert A.,	Brookline.
Bruce, Nathaniel F.,	Stoneham.	Coburn, Isaac E.,	Everett.
Bullard, William S.,	Boston.	Codman, James M.,	Brookline.
Burnett, Joseph,	Southborough.	Codman, Ogden,	Lincoln.
Burnham, T. O. H. P.,	Boston.	Coffin, G. Winthrop,	West Roxbury.
Burr, Fearing,	Hingham.	Coffin, William E.,	Boston.
Burr, Matthew H.,	"	Converse, E. S.,	Malden.
Buswell, Edwin W.,	Boston.	Converse, Parker L.,	Woburn.
Buswell, Frank E.,	"	Coolidge, Joshua,	Watertown.
Butler, Aaron,	Wakefield.	Copeland, Franklin,	West Dedham.
Butterfield, Wm. P.,	Arlington.	Cox, George P.,	Malden.
		Coy, Samuel I.,	Boston.
Cadness, John,	Flushing, N. Y.	Craft, George,	Brookline.
Cains, William,	South Boston.	Crocker, George O.,	New Bedford.
Calder, Augustus P.,	Boston.	Crocker, Uriel,	Boston.
Capen, John,	"	Crosby, Josiah,	Arlington.
Carlton, Samuel A.,	Somerville.	Crowell, Philander,	Chelsea.
Carruth, Charles,	Boston.	Crowell, Randall H.,	"
Carruth, Nathan,	Dorchester.	Cummings, John,	Woburn,
Carter, Miss Sabra,	Wilmington.	Curtis, Charles F.,	Jamaica Plain.
Chamberlain, C. W.,	Arlington.	Curtis, George S.,	" "
Chapin, N. G.,	Brookline.	Cushing, John G.,	Boston.
Chapman, Edward,	Arlington.	Cushing, Robert M.,	"
Chase, A. J.,	Lynn.		
Chase, Daniel E.,	Somerville.	Daggett, Henry C.,	Boston.
Chase, Hezekiah S.,	Boston.	Damon, Samuel G.,	Arlington.
Chase, William M.,	Worcester.	Dana, Charles B.,	Brookline.
Cheney, Benjamin P.,	Boston.	Darling, Charles K.,	Boston.
Child, Francis J.,	Cambridge.	Davenport, Edward,	Dorchester.
Child, William C.,	Medford.	Davenport, Geo. E.,	Boston.
Childs, Francis,	Charlestown.	Davenport, Henry,	"
Childs, N. R.,	Dorchester.	Davis, Curtis,	Cambridge.
Claflin, Henry,	Brighton.	Davis, Hervey,	Cambridgeport.
Claflin, William,	Newton.	Dawson, Jackson,	West Roxbury.
Clapp, Edward B.,	Dorchester.	Deblois, Stephen G.,	Boston.
Clapp, E. W.,	Walpole,	Denny, Clarence H.,	"
Clapp, James H.,	Dorchester.	Denny, R. S.,	Dorchester.
Clapp, Lemuel,	"	Denton, Eben,	Braintree.
Clapp, William C.,	"	Dewson, Francis A.,	Boston.
Clark, Orus,	Boston.	Dexter, F. Gordon,	"
Clark, William S.,	Amherst.	Dickerman, Geo. H.,	Somerville.
Clark, W. L.,	Neponset.	Dickinson, Alex.,	Cambridgeport.
Clarke, Miss Cora H.,	Jamaica Plain.	Dike, Charles C.,	Stoneham.
Clay, Henry,	Dorchester.	Dix, Joseph,	Boston.

Dorr, George,	Dorchester.	Gillard, William,	Boston.
Dove, George W. W.,	Andover.	Gilson, F. Howard,	Reading.
Downer, Samuel,	Dorchester.	Glover, Albert,	Boston.
Durant, Henry F.,	Boston.	Glover, Joseph B.,	"
Durant, William,	"	Goddard, A. Warren,	Brookline.
Durfee, Mrs. F. B.,	Fall River.	Goddard, Mrs. M. T.,	Newton.
Durfee, George B.,	" "	Gorham, James L.,	Jamaica Plain.
Dutcher, F. J.,	Hopedale.	Gould, Francis,	Arlington.
D'Wolf, John L.,	Boston.	Gould, Samuel,	Boston.
		Gray, James,	Wellesley.
Eaton, Horace,	Quincy.	Gregory, J. J. H.,	Marblehead.
Eldridge, Azariah,	Yarmouthport.	Greig, George,	Newton.
Eldridge, E. H.,	Boston.	Grinnell, Joseph,	New Bedford.
Ellicott, J. P.,	Jamaica Plain.	Groom, Thomas,	Dorchester.
Endicott, William E.,	Canton.	Grundel, Hermann,	"
Eustis, William C.,	Hyde Park.	Guild, J. Anson,	Brookline.
Everett, George,	Concord.		
Everett, Otis,	Boston.	Hadwen, Obadiah B.,	Worcester.
Everett, William,	"	Hall, Edwin A.,	Cambridgeport.
Ewell, William,	Dorchester.	Hall, George A.,	Chelsea.
		Hall, George R.,	Boston.
Farlow, John S.,	Newton.	Hall, John R.,	"
Faxon, John,	Quincy.	Hall, Lewis,	Cambridge.
Fay, Mrs. R. L.,	Chelsea.	Hall, Stephen A.,	Revere.
Fenno, J. B.,	Boston.	Hall, William F.,	Brookline.
Fewkes, Edwin,	Newton High'ds.	Halliday, William H.,	Boston.
Fillebrown, John,	Arlington.	Hammond, Gard. G.,	"
Fisher, James,	Boston.	Hammond, Samuel,	"
Fisher, Warren,	"	Hanson, P. G.,	Woburn.
Flagg, Augustus,	"	Harding, C. L.,	Cambridge.
Fleming, Edwin,	West Newton.	Harding, George W.,	Dorchester.
Fletcher, John W.,	Chelsea.	Harding, Lewis B.,	Boston.
Flint, Charles L.,	Boston.	Harding, W. C.,	"
Flint, David B.,	Watertown.	Hardy, F. D., Jr.,	Cambridgeport.
Flynt, William N.,	Monson.	Harris, Charles,	Cambridge.
Foster, John H.,	Boston.	Hastings, Edm. T.,	Boston.
Fowle, William B.,	Auburndale.	Hathaway, Seth W.,	Marblehead.
Freeland, Chas. Wm.,	Boston.	Haughton, James,	Boston.
Freeman, Abraham,	Dorchester.	Haven, Alfred W.,	Portsm'th, N.H.
French, Jonathan,	Boston.	Hayes, Daniel F.,	Exeter, N. H.
French, J. D. W.,	"	Hayes, Francis B.,	Boston.
Fuller, Henry Weld,	"	Hazeltine, Hazen,	"
		Head, Charles D.,	Brookline.
Galvin, John,	West Roxbury.	Hilbourn, A. J.,	Chelsea.
Gardner, Henry N.,	Belmont.	Hill, George,	Arlington.
Gardner, John L.,	Brookline.	Hill, John,	Stoneham.
Gibbs, Wolcott,	Cambridge.	Hilton, William,	Boston.

Hitchings, E. H.,	Boston.	Keyes, George,	Concord.
Hodgkins, John E.,	Chelsea.	Kidder, Henry P.,	Boston.
Hollis, John W.,	Brighton.	Kidder, Nath'l T.,	"
Holt, Mrs. S. A.,	Winchester.	Kimball, A. P.,	"
Hooper, Robert C.,	Boston.	King, Franklin,	Dorchester.
Hooper, Thomas,	Bridgewater.	King, William S.,	Boston.
Horner, Mrs. C. N. S.,	Georgetown.	Kingman, Abner A.,	Brookline.
Hovey, Charles H.,	Cambridge.	Kingman, C. D.,	Middleborough.
Hovey, Charles M.,	"	Kinsley, Lyman,	Cambridgeport.
Hovey, John C.,	Cambridgeport.	Kittredge, E. A.,	Boston.
Hovey, P. Brown,	"		
Howe, George,	Boston.	Lamb, Thomas,	Boston.
Howland, John, Jr.,	New Bedford.	Lancaster, Charles B.,	Newton.
Hubbard, Charles T.,	Boston.	Lawrence, Amos A.,	Brookline.
Hubbard, G. G.,	Cambridge.	Lawrence, Edward,	Charlestown.
Hubbard, J. C.,	Boston.	Lawrence, James,	Boston.
Hubbard, William J.,	"	Lawrence, James,	Groton.
Huckins, J. W.,	"	Lawrence, John,	Boston.
Humphrey, F. J..	Dorchester.	Lawson, Peter,	Lowell.
Humphrey, G. W.,	Dedham.	Leavens, S. Davis,	Boston.
Hunneman, Jos. H.,	Boston.	Lee, Henry,	"
Hunnewell, H. H.,	Wellesley.	Leeson, Joseph R.,	Newton Centre.
Hunt, Franklin,	Boston.	Lemme, Frederick,	Natick.
Hunt, Moses,	"	Leuchars, Robert B.,	Boston.
Hunt, William H.,	Concord.	Lewis, A. S.,	Framingham.
Hyde, James F. C.,	Newton.	Lewis, William G.,	"
		Lincoln, George,	Hingham.
Inches, Henderson,	Boston.	Locke, William H.,	Belmont.
Inches, Herman B.,	"	Lodge, Giles H.,	Swampscott.
		Loftus, John P.,	Boston.
Jackson, Abraham,	Boston.	Loomis, Jason B.,	Chelsea.
Janvrin, William S.,	Revere.	Lord, George C.,	Newton.
Jeffries, John, Jr.,	Boston.	Loring, Alfred,	South Hingham.
Jenks, Charles W.,	"	Loring, Caleb W.,	Boston.
Joyce, Mrs. E. S.,	Medford.	Loring, George B.,	Salem.
		Lovett, George L.,	Boston.
Kakas, Edward,	Medford.	Low, Ariel,	"
Kelley, E. G.,	Newburyport.	Lowder, John,	Watertown.
Kendall, D. S.,	Woodstock, Ont.	Lowell, Augustus,	Boston.
Kendall, Edward,	Cambridgeport.	Luke, Elijah H.,	Cambridgeport.
Kendall, J. R.,	Woburn.	Lumb, William,	Boston.
Kendrick, Mrs. H. P.,	Allston.	Lunt, Charles H.,	Jamaica Plain.
Kennard, Charles W.,	Boston.	Lyman, Theodore,	Brookline.
Kennedy, George G.,	"	Lyon, Henry,	Charlestown.
Kenney, John M.,	Wareham.		
Kent, John,	Charlestown.	Mahoney, John,	Boston.
Keyes, E. W.,	Denver, Col.	Mann, James F.,	Cambridge.

Mann, Jonathan,	Cambridge.	Parker, Augustus,	Boston.
Manning, Jacob W.,	Reading.	Parker, William A.,	"
Manning, Mrs. L. B.,	"	Parkman, Francis,	Jamaica Plain.
Manning, Robert,	Salem.	Partridge, Henry,	Dunkirk, N. Y.
Mansfield, Henry S.,	Blackstone.	Partridge, Horace,	Somerville.
Marshall, Frederick,	Everett.	Paul, Alfred W.,	Dighton.
Martin, Darius A.,	Chelsea.	Pearce, John,	West Roxbury.
Martin, John S.,	Boston.	Peck, O. H.,	Franklin.
Matthews, Nathan,	"	Peck, W. G.,	Arlington.
McCarty, Timothy,	"	Penniman, A. P.,	Waltham.
McClure, John,	Revere.	Perkins, Augustus T.,	Boston.
Merriam, M. H.,	Lexington.	Perkins, Edward N.,	Brookline.
Merrifield, W. T.,	Worcester.	Perkins, William P.,	"
Miller, Erasmus D.,	Dorchester.	Perry, George W.,	Malden.
Mills, Charles H.,	Boston.	Philbrick, William D.,	Newton Centre.
Milmore, Martin,	"	Phillips, John C.,	Boston.
Minton, James,	Dorchester.	Pierce, George W.,	Everett.
Mixter, Charles,	Boston.	Pierce, Henry L.,	Dorchester.
Moore, John B.,	Concord.	Pierce, Samuel B ,	"
Morrill, Joseph, Jr.,	Boston.	Poole, Benjamin C.,	Chelsea.
Morse, Samuel F.,	"	Poor, John R.,	Somerville.
Morse, Sidney B.,	"	Potter, Joseph S.,	Arlington.
Motley, Thomas,	West Roxbury.	Prang, Louis,	Boston.
Mudge, E. R.,	Swampscott.	Pratt, Robert M.,	"
Mudge, George A.,	Portsm'th, N.H.	Pratt, William,	Winchester.
Mudge, George W.,	Lynn.	Pray, Mark W.,	Malden.
Munroe, Otis,	Boston.	Prescott, C. H.,	Cornwallis, N.S.
		Prescott, Eben C.,	Boston.
Needham, Daniel,	Groton.	Prescott, W. G.,	"
Newhall, George,	Dorchester.	Prescott, William G.,	Quincy.
Newman, J. R.,	Winchester.	Preston, George H.,	Boston.
Newton, Rev. W. W.,	Boston.	Preston, John,	Dorchester.
Nichols, Mrs. F.,	Dorchester.	Pringle, Cyrus G.,	Charlotte, Vt.
Nickerson, Alfred W.,	Dedham.	Proctor, Thomas P.,	West Roxbury.
Nourse, Benjamin F.,	Cambridgeport.	Prouty, Gardner,	Littleton.
Nourse, Benjamin F.,	Boston.	Putnam, Joshua H.	Brookline.
Oakman, Hiram A.,	No. Marshfield.	Ramsay, A. H.,	Cambridge.
Osgood, Jas. Ripley,	Boston.	Rand, Miss E. L.,	NewtonHighl'ds
Otis, Theodore C.,	"	Rand, Edward S.,	Boston.
Oxnard, George D.,	"	Rand, Oliver J.,	Cambridgeport.
		Rawson, W. W.,	Arlington.
Packer, Charles H.,	Boston.	Rayner, John J.,	Lexington.
Page, Thomas,	"	Reed, George W.,	Boston.
Paine, Robert T.,	"	Richards, John J.,	"
Palmer, John P.,	"	Richards, William B.,	"
Park, John C.,	Somerville.	Richardson, C. E.,	Philadelphia.

Richardson, Geo. C., Cambridge.
Robbins, I. Gilbert, Boston.
Robbins, Nathan, Arlington.
Robeson, W. R., Boston.
Robinson, J. H., Dorchester.
Robinson, John, Salem.
Rogers, John H., Boston.
Ross, Henry, Newton.
Ross, M. Denman, Boston.
Ross, Waldo O., "
Russell, George, Woburn.
Russell, Walter, Arlington.

Sampson, George R., New York.
Sanborn, Amos C., Cambridgeport.
Sanford, O. S., Cordaville.
Sargent, Charles S., Brookline.
Sargent, Ignatius, "
Saville, Richard L., "
Sawyer, Timothy T., Charlestown.
Scott, Charles, Newton.
Scudder, C. W., Brookline.
Seaver, Nathaniel, East Boston.
Seaver, Robert, Jamaica Plain.
Shaw, C. C., Milford, N. H.
Shaw, S. P., Cambridge.
Sheafe, Charles C., Boston.
Sheafe, William, Brookline.
Sheldon, Oliver S., Milton.
Shimmin, Charles F., Boston.
Shorey, John L., Lynn.
Skinner, Francis, Boston.
Slack, Charles W., "
Slack, Lewis, Brookline.
Smith, Benjamin G., Cambridge.
Smith, Calvin W., Grantville.
Smith, Charles H., Jamaica Plain.
Smith, Chauncy, Cambridge.
Smith, E. N., San Francisco.
Smith, George O., Boston.
Smith, James H., Needham.
Smith, W. B., Boston.
Snow, Eben, Cambridge.
Snow, Miss SalomeH., Brunswick, Me.
Southmayd, John K., Boston.
Sparhawk, Edw'd C., Brighton.
Spaulding, Edward, Jamaica Plain.
Spaulding, M. D., Boston.
Speare, Alden, Newton Centre.
Springall, George, Malden.
Springer, John, Sterling.
Stetson, James A., Quincy.
Stetson, Nahum, Bridgewater.
Stickney, Rufus B., Somerville.
Stimpson, George, New York.
Stimpson, H. H., Cambridge.
Stone, Amos, Everett.
Stone, George F., Newton.
Stone, Phineas J., Charlestown.
Story, E. Augustus, Brighton.
Strong, William C., Newton Centre.
Sturgis, John H., Boston.
Sturgis, Russell, Jr., "
Sturtevant, E. Lewis, S. Framingham.
Sumner, Edward, Dedham.
Surette, Louis A., Concord.
Swain, Charles D., Roxbury.

Taft, John B., Boston.
Tappan, Charles, "
Taylor, Horace B., "
Thacher, Alfred C., Dorchester.
Thayer, Henry, N. Cambridge.
Thayer, Nathaniel, Boston.
Thompson, S. Benton, "
Thurlow, Thomas C., Newburyport.
Tilton, Stephen W., Boston.
Todd, John, Hingham.
Tolman, Benjamin, Concord.
Tolman, Miss H. S., Boston.
Torrey, Everett, Charlestown.
Turner, John M., Dorchester.
Turner, Roswell W., Newton.
Turner, Royal W., Randolph.

Underwood, Guy C., Boston.
Upham, Henry, Brookline.

Vass, William J., Boston.
Vinton, A. H., D. D., Pomfret, Conn.
Vose, Benjamin C., Hyde Park.

Wainwright, Wm. L., Braintree.
Wakefield, E. H., Chelsea.

Walcott, Edward,	Pawtucket.	White, Edward A.,	Boston.
Walcott, Henry P.,	Cambridge.	White, Francis A.,	Brookline.
Wales, George O.,	Braintree.	Whitely, Edward,	Cambridge.
Walker, Edw. C. R.,	Dedham.	Whiting, Nathaniel,	Brookline.
Walker, Samuel A.,	"	Whitmore, C. O.,	Boston.
Walker, T. W.,	Waltham.	Whittle, George W.,	Somerville.
Walley, Mrs. W. P.,	Boston.	Whytal, Thomas G.,	New York.
Ward, John,	Newton.	Wilbur, G. B.,	Watertown.
Wardwell, W. H.,	" Centre.	Wilcutt, Levi L.,	West Roxbury.
Ware, Benjamin P.,	Beach Bluff.	Wilder, Henry A.,	Boston.
Warren, George W.,	Boston.	Wilder, Marshall P.,	Dorchester.
Wason, Elbridge,	Brookline.	Williams, Aaron D.,	Boston.
Waters, Edwin F.,	Newton Centre.	Williams, Benj. B.,	"
Waters, George F.,	Newton.	Williams, Philander,	Taunton.
Watts, Isaac,	Belmont.	Willis, George W.,	Chelsea.
Webber, Aaron D.,	Boston.	Willis, J. C.,	Boston.
Weld, Aaron D.,	West Roxbury.	Wilson, Henry W.,	South Boston.
Weld, Dr. Moses W.,	Boston.	Winship, F. Lyman,	Brighton.
Weld, Richard H.,	"	Winship, Herman,	"
Weld, William G.,	Brookline.	Woerd, Charles V.,	Waltham.
Weston, Leonard W.,	Lincoln.	Woerd, C. V., Jr.,	"
Weston, Seth,	Revere.	Wood, Luke H.,	Marlborough.
Wetherell, Leander,	Boston.	Wood, R. W.,	Jamaica Plain.
Wheelwright, A. C.,	"	Wood, William K.,	West Newton.
Whipple, John A.,	"	Woodward, Royal,	Brookline.
Whitcomb, Wm. B.,	Medford.	Wright, George C.,	West Acton.
White, Benjamin C.,	Boston.	Wrisley, Frank,	New York.

ANNUAL MEMBERS.

Abbott, S. L., M. D.,	Boston.
Adams, Charles F.,	Quincy.
Adams, C. S.,	Framingham.
Allen, Andrew F.,	Arlington.
Allen, Calvin,	Boston.
Allen, Nathaniel T.,	West Newton.
Ames, R. W.,	Boston.
Anderson, Charles J.,	Longwood.
Atkinson, Chas. M.,	Brookline.
Atkinson, Edward,	"
Atkinson, W. B.,	Newburyport.
Bacon, Augustus,	Boston.
Bacon, William,	"
Bard, James,	Framingham.
Barker, John G.,	Lynn.
Barnes, Parker,	Dorchester.
Beard, Edward L.,	Cambridge.
Beebe, J. Arthur,	Boston.
Bird, Charles,	Revere.
Bird, John L.,	Dorchester.
Bliss, B. K.,	New York.
Bolles, Matthew,	Boston.
Bolles, William P.,	"
Bolton, John B.,	Somerville.
Boott, William,	Boston.
Bradlee, John T.,	"
Breck, Charles H.,	Brighton.
Breck, Charles H. B.,	"
Brewer, Thomas M.,	Boston.
Brooks, George,	Brookline.
Brown, A. S.,	Jamaica Plain.
Brown, Atherton T.,	Boston.
Brown, Benjamin F.,	Charlestown.
Brown, Jona., Jr.,	Somerville.
Brown, Joseph T.,	Boston.
Bryant, G. J. F.,	"
Bull, E. W.,	Concord.
Bullard, Calvin,	Boston.
Burley, Edward,	Beverly.
Burr, Charles C.,	Newton.
Butler, Edward,	Wellesley.
Capen, Aaron D.,	Mattapan.
Carter, Maria E.,	Woburn.
Cartwright, James,	Wellesley.
Chadbourne, M. W.,	Watertown.
Chaffin, John C.,	Newton.
Chapin, Gardner S.,	Arlington.
Chapin, George H.,	Watertown.
Chase, Mrs. C. B.,	Medford.
Chase, Henry L.,	Lynn.
Chase, Joseph S.,	Malden.
Cheney, Amos P.,	Natick.
Clark, James W.,	Framingham.
Clark, Joseph,	Canton.
Clark, Joseph W.,	Dedham.
Cobb, Jonathan H.,	"
Coe, Henry F.,	West Roxbury.
Comley, James,	Lexington.
Cox, James F.,	Abington.
Crafts, William A.,	Boston.
Cruickshanks, J. T.,	Natick.
Curtis, Daniel T.,	Boston.
Curtis, Joseph H.,	"
Darling, Moses, Jr.,	South Boston.
Davenport, A. M.,	Watertown.
Davis, Frederick,	Newton.
Davis, James,	Boston.
Davis, Thomas M.,	Cambridgeport.
Day, George B.,	Boston.
Dean, A. J.,	"
Dolbear, Mrs. Alice J.,	Somerville.
Doogue, William,	Boston.
Duffley, Daniel,	Brookline.
Dupee, James A.,	"
Dyer, Mrs. E. D.,	Eyota, Minn.

Eaton, Jacob,	Cambridgeport.	Hartwell, Samuel,	Lincoln.
Edgar, William,	Newtonville.	Harwood, George S.,	Newton.
Ewings, Luther B.,	Boston.	Haskell, Edward,	New Bedford.
		Hatch, Samuel,	Boston.
Falconer, John,	Rochester.	Hayes, John L.,	Cambridge.
Falconer, William,	Cambridge.	Hayward, Daniel H.,	No. Cambridge.
Farrier, Amasa,	Stoneham.	Hayward, George P.,	Hingham.
Farrier, Mrs. C.,	"	Hazleton, H. L.,	Boston.
Fay, Henry G.,	Brookline.	Hersey, Alfred H.,	Hingham.
Felton, Arthur W.,	West Newton.	Hersey, Edmund,	"
Fenno, Warren,	Revere.	Heustis, Warren,	Belmont.
Fletcher, Edwin,	Acton.	Hews, Albert H.,	No. Cambridge.
Foster, Joshua T.,	Medford.	Higbee, Charles H.,	Salem.
Fowle, Henry D.,	Boston.	Hill, Benjamin D.,	Peabody.
French, William E.,	"	Hill, Miss Katie A.,	Lowell.
Frost, George,	West Newton.	Hinckley, Mrs. D. F.,	Chelsea.
Frost, Stiles,	" "	Howe, Rufus,	Marlborough.
Fuller, William G.,	Stoneham.	Hubbard, Joel W.,	Boston.
Gane, Henry A.,	West Newton.	Ireland, George W.,	Somerville.
Gardiner, Claudius B.,	Newburyport.		
Gardner, John,	Dedham.	Jameson, G. W.,	East Lexington.
Garfield, Charles,	Medford.	Jones, Moses,	Brookline.
Gaut, Samuel N.,	Somerville.	Jordan, Samuel,	Yarmouth.
Gilbert, John,	Boston.		
Gilbert, Samuel,	"	Kelsey, Fred W.,	Waverly, N. Y.
Gilbert, W. A.,	Neponset.	Kendall, Jonas,	Framingham.
Gill, Mrs. E. M.,	Medford.	Kennard, Martin P.,	Brookline.
Gleason, C. W.,	Boston.	Kenrick, Miss A. C.,	Newton.
Gleason, Herbert,	Malden.		
Godbold, G. A.,	Chelsea.	Lamprell, Simon,	Marblehead.
Goddard, Thomas,	Boston.	Lang, John H. B.,	Dorchester.
Goodwin, Lester,	Brighton.	Langworthy, I. P.,	Chelsea.
Grant, Charles E.,	Boston.	Leavens, E. W.,	Malden.
Graves, Frank H.,	West Newton.	Lee, Francis H.,	Salem.
Gray, Howard,	Dorchester.	Livermore, Miss M.,	Mt. Auburn.
Gray, John C.,	Boston.	Loring, Charles G.,	Boston.
Gray, William, Jr.,	Dorchester.	Loring, John A.,	"
Gray, William, 3d,	"	Lothrop, David W.,	West Medford.
Greene, Malcolm H.,	"	Lothrop, H. A.,	Sharon.
Grew, Henry,	"	Lothrop, Thornton K.,	Boston.
Guerineau, Louis,	Malvern, Ark.	Lowell, John,	Newton.
Hall, William T.,	Revere.	Marcou, Mrs. J.,	Cambridge.
Hamlin, Delwin A.,	South Boston.	Markoe, G. F. H.,	Boston.
Harris, Miss Ellen M.,	Jamaica Plain.	May, F. W. G.,	"
Harris, Frederick L.,	South Natick.	McDermott, Andrew,	"

McIntosh, A. S., Boston.
McLaren, Anthony, Forest Hills.
Mellen, George M., Brookline.
Merrill, J. Warren, Cambridgeport.
Merrill, S. A., Danvers.
Minton, Peter J., Forest Hills.
Morandi, Francis, Malden.
Morris, Thomas D., Boston.
Morrison, Hugh, Bay View.
Morse, William A., Boston.
Morton, James H., "
Murray, Daniel D., Brookline.
Muzzey, Rev. A. B., Cambridge.

Nightingale, Crawford, Dorchester.
Norton, Michael H., Boston.
Norton, Patrick, "
Noyes, George N., Auburndale.
Nugent, James, Boston.

O'Brien, James, Jamaica Plain.
Oldreive, Richard, Newton.
Olney, Richard, West Roxbury.
Owen, John, Cambridge.

Park, William D., Boston.
Parker, Harvey D., "
Parker, John, "
Parsons, William, "
Patterson, James, Cambridge.
Payson, Samuel R., Boston.
Pettingill, Thos. S., Brookline.
Phillips, Nathaniel, Dorchester.
Pickering, Mrs. E. C., Cambridge.
Plimpton, W. P., West Newton,
Power, Charles J., S. Framingham.
Pratt, Lucias G., West Newton.
Pratt, Mrs. Mary L., Hingham.
Pratt, Samuel, Chelsea.
Prince, Thomas, Boston.
Putnam, Charles A., Salem.
Putnam, Henry W., "

Randall, Macey, Sharon.
Ranlett, S. A., Melrose.
Richards, John S., Brookline.
Richardson, E. P., Lawrence.
Richardson, Horace, Framingham.
Ridler, Charles E., Kingston.
Roberts, Edward, Hyde Park.
Rogers, John F., Cambridge.
Ross, Charles W., Newtonville.
Russell, George, Boston.

Saunders, Miss M.T., Salem.
Saville, George, Quincy.
Sawtell, J. M., Fitchburg.
Schlegel, Adam, Boston.
Scott, A. E., Lexington.
Scott, George H., Allston.
Scudder, Samuel H., Cambridge.
Shattuck, F. R., Boston.
Shedd, Abraham B., Lexington.
Shedd, Arthur B., "
Shepherd, C. W., West Newton.
Sheppard, Edwin, Lowell.
Sherman, Japhet, Medford.
Simpson, Michael H., Saxonville.
Sleeper, John S., Boston.
Snow, Eugene A., Melrose.
Southworth, Edward, Quincy.
Spooner, William H., Jamaica Plain.
Sprague, Charles J., Boston.
Squire, John P., Arlington.
Starbird, Louis D., Malden.
Stevenson, Hamilton, Woburn.
Stone, Eliphalet, Dedham.
Stone, Samuel G., Charlestown.
Story, Miss Sarah W., Brighton.
Sullivan, J. L. D., Somerville.
Swan, Charles W., Boston.

Tailby, Joseph, Wellesley.
Talbot, Josiah W., Norwood.
Tapper, Thomas, Canton.
Tobey, Miss M. B., Brookline.
Todd, Jacob, Boston.
Torrey, Bradford, "
Trautman, Martin, "
Turner, Nathaniel W., "

Underwood, Wm. J., Belmont.

Vandine, Henry, Cambridgeport.

Vinton, Mrs. C. A.,	Boston.	Whitney, Joel,	Winchester.
		Whiton, Starkes,	HinghamCentre.
Walker, Charles H.,	Chelsea.	Wilde, Hiram,	Randolph.
Walker, Joseph T.,	Boston.	Williams, Dudley,	Jamaica Plain.
Walker, William P.,	Somerville.	Wilmarth, H. D.,	" "
Washburn, E. Fred,	Neponset.	Wilson, B. Osgood,	Watertown.
Watson, David,	Malden.	Wilson, George W.,	Malden.
Webster, John,	Salem.	Wiswall, Henry M.,	Watertown.
Wellington, Chas. A.,	E. Lexington.	Wolcott, Mrs. J. W.,	Boston.
Wellington, Jos. V.,	Cambridge,	Wood, Mrs. Anna D.,	West Newton.
Wells, Benjamin T.,	Boston.	Wood, Miss C. S.,	" "
Weston, Mrs. L. P.,	Danvers.	Wood, E. W.,	" "
Wheatland, Henry,	Salem.	Woodford, Jos. H.,	Newton.
Wheeler, Miss Ann C.,	Cambridgeport.		
Wheildon, Wm. W.,	Concord.	Zirngiebel, Denys,	Needham.
White, Nelson B.,	Norwood.		

EXTRACTS FROM THE BY-LAWS.

SECTION XXVI.—Life Members.

The payment of thirty dollars shall constitute a Life Membership, and exempt the member from all future assessments; and any member, having once paid an admission fee, may become a Life Member by the payment of twenty dollars in addition thereto.

SECTION XXVII.—Admission Fee and Annual Assessment.

Every subscription member, before he receives his Diploma, or exercises the privileges of a member, shall pay the sum of ten dollars as an admission fee, and shall be subject afterwards to an annual assessment of two dollars.

SECTION XXIX.—Discontinuance of Membership.

Any member who shall neglect for the space of two years to pay his annual assessment, shall cease to be a member of the Society, and the Treasurer shall erase his name from the List of Members.

The attention of Annual Members is particularly called to Section XXIX.

HONORARY MEMBERS.

A * denotes the member deceased. Correspondents of the Society and others will confer a favor by communicating to the Secretary information of the decease, change of residence, etc., of Honorary or Corresponding Members.

*Benjamin Abbott, LL. D., Exeter, N. H.
*John Abbott, Brunswick, Me.
*Hon. John Quincy Adams, LL. D., late President of the United States, Quincy.
*Prof. Louis Agassiz, Cambridge.
*William T. Aiton, late Curator of the Royal Gardens, Kew, England.
Thomas Allen, ex-President of the St. Louis Horticultural Society, St. Louis, Mo., and Pittsfield, Mass.
*Hon. Samuel Appleton, Boston.
*Hon. James Arnold, New Bedford.
*Edward Nathaniel Bancroft, M. D., late President of the Horticultural and Agricultural Society of Jamaica.
*Hon. Philip P. Barbour, Virginia.
*Don Angel Calderon de la Barca, late Spanish Minister at Washington.
*Robert Barclay, Bury Hill, Dorking, Surrey, England.
*James Beekman, New York.
*L'Abbé Berlèse, Paris.
*Nicholas Biddle, Philadelphia.
*Dr. Jacob Bigelow, Boston.
*Mrs. Lucy Bigelow, Medford.
*Le Chevalier Soulange Bodin, late Secrétaire-Général de la Société d'Horticulture de Paris.
Hon. George S. Boutwell, Groton.
*Josiah Bradlee, Boston.
*Hon. George N. Briggs, Pittsfield.
*Hon. James Buchanan, late President of the United States, Lancaster, Penn.
*Jesse Buel, late President of the Albany Horticultural Society, Albany, N. Y.
*Hon. Edmund Burke, late Commissioner of Patents, Washington, D. C.
*Augustin Pyramus de Candolle, Geneva.
Hon. Horace Capron, ex-U. S. Commissioner of Agriculture, Washington. D. C.
*Commodore Isaac Chauncey, U. S. Navy, Brooklyn, N. Y.

*Ward Chipman, late Chief Justice of New Brunswick, St. John.
*Lewis Clapier, Philadelphia.
*Hon. Henry Clay, Lexington, Ky.
H. W. S. Cleveland, Chicago, Ill.
*Admiral Sir Isaac Coffin, Bart, England.
*Zaccheus Collins, late President of the Pennsylvania Horticultural Society, Philadelphia.
*Roswell L. Colt, Paterson, New Jersey.
Caleb Cope, ex-President of the Pennsylvania Horticultural Society, Philadelphia.
*William Coxe, Burlington, N. J.
*John P. Cushing, Watertown.
*Charles W. Dabney, late U. S. Consul, Fayal, Azores.
*Hon. John Davis, LL. D., Boston.
*Sir Humphry Davy, London.
*Gen. Henry Alexander Scammel Dearborn, Roxbury.
*James Dickson, late Vice-President of the Horticultural Society of London.
*Mrs. Dorothy Dix, Boston.
*Capt. Jesse D. Elliot, U. S. Navy.
*Hon. Stephen Elliot, LL. D., Charleston, S. C.
*Hon. Henry L. Ellsworth, late Commissioner of Patents, Washington, D. C.
*Allyn Charles Evanson, late Secretary of the King's County Agricultural Society, St. John, N. B.
*Hon. Edward Everett, LL. D., Boston.
*Hon. Horace Everett, Vermont.
*F. Faldermann, late Curator of the Imperial Botanic Garden, St. Petersburg.
*Hon. Millard Fillmore, late President of the United States, Buffalo, N.Y.
*Dr. F. E. Fischer, late Professor of Botany at the Imperial Garden, St. Petersburg.
*Hon. Theodore Frelinghuysen, late President of the American Agricultural Society, New Brunswick, N. J.
*Joseph Gales, Jr., late Vice-President of the Horticultural Society, Washington, D. C.
*George Gibbs, New York.
*Stephen Girard, Philadelphia.
*Hon. Robert T. Goldsborough, Talbot County, Maryland.
*Ephraim Goodale, South Orrington, Maine.
*Mrs. Rebecca Gore, Waltham.
*Hon. John Greig, late President of the Domestic Horticultural Society, Canandaigua, N. Y.
*Mrs. Mary Griffith, Charlies Hope, N. J.
*Gen. William Henry Harrison, late President of the United States, North Bend, O.
*S. P. Hildreth, M. D., Marietta, O.
*Thomas Hopkirk, late President of the Glasgow Horticultural Society.
*David Hosack, M. D., late President of the New York Horticultural Society.

*Lewis Hunt, Huntsburg, O.
*Joseph R. Ingersoll, late President of the Pennsylvania Horticultural Society, Philadelphia.
*Gen. Andrew Jackson, late President of the United States, Nashville, Tenn.
*Mrs. Martha Johonnot, Salem.
*Jared Potter Kirtland, M. D., LL. D., East Rockport, O.
*Thomas Andrew Knight, late President of the Horticultural Society of London.
*Gen. La Fayette, La Grange, France.
*Le Comte de Lasteyrie, late Vice-President of the Horticultural Society of Paris.
L. A. H. Latour, M. P., 1396 St. Catherine street, Montreal, Canada.
*Baron Justus Liebig, Giessen, Germany.
*Prof. John Lindley, late Secretary of the Horticultural Society of London.
Franklin Litchfield, U. S. Consul at Puerto Cabello, Venezuela.
*Joshua Longstreth, Philadelphia.
*Nicholas Longworth, Cincinnati.
*Jacob Lorillard, late President of the New York Horticultural Society.
*John C. Loudon, London.
Hon. John A. Lowell, Boston.
*Baron Charles Ferdinand Henry Von Ludwig, late Vice-President of the South African Literary and Scientific Institution, Cape Town, Cape of Good Hope.
*Hon. Theodore Lyman, Brookline.
Col. Theodore Lyman, Brookline.
*Hon. James Madison, late President of the United States, Montpelier, Va.
*Mrs. Charlotte Marryatt, Wimbledon, near London.
Joseph Maxwell, Rio Janeiro.
D. Smith McCauley, U. S. Consul-General, Tripoli.
*Hon. Isaac McKim, late President of the Horticultural Society of Maryland, Baltimore.
Rev. James H. Means, Dorchester, Mass.
*James Mease, M. D., Philadelphia.
*Lewis John Mentens, Brussels, Belgium.
*Hon. Charles F. Mercer, Virginia.
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A HISTORY

OF

AMERICAN HORTICULTURE.

The attention of Trustees and Librarians of Public Libraries, and of Horticulturists generally, is called to the History of the Massachusetts Horticultural Society, for fifty years, from its foundation in 1829. This work will be found of general interest, as the introduction comprises a sketch much fuller than exists elsewhere, of the History of Horticulture in the United States, from the settlement of the country to the foundation of the Society, and the history of the Society onward is, in the language of President Hovey, in his address at the dedication of the present Hall of the Society, "the History of Horticulture in our country." It is handsomely printed, on an extra quality of paper, and embellished with a fine steel engraving of Gen. H. A. S. Dearborn, the first president, and heliotypes of the two Halls erected by the Society. Among other interesting matters, it contains an account of the foundation by the Society, of Mount Auburn Cemetery, the parent of all similar cemeteries in the country.

The work is furnished to members of the Society at cost, $2.50, and to others than members for $3, but will be supplied to public libraries and booksellers at the same price as to members. Please address the Secretary of the Society, at Horticultural Hall, Boston.

ROBERT MANNING,

Secretary.